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Telephony

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THE JOURNAL OF THE TELEPHONE INDUSTRY

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SUBSCRIBER'S NEED	STROME
1. Moisture-proof, concussion-proof, weather-proof telephone for use doors or in underground localities. Magneto type	Yes (8
2. Moisture-proof, concussion-proof, weather-proof telephone for use doors or in underground localities. Dial type	Yes (5
3. Self-contained desk type magneto telephone	Yes (
4. Self-contained wall type magneto telephone	Yes (
5. Magneto desk set box. (May be used with 1544 or 1534-M telepho make a 2-piece set.)	Yes (
6. Desk set telephones with multi-line push buttons. For use with int systems	Yes (
7. Suspended handset type telephone for use where space is at a pren (manual and dial instruments)	Yes (
8. Suspended handset type telephone. Complete instrument with buzzer for signal (manual and dial instruments)	Yes (
9. Suspended handset type telephone for flush mounting on wall. plete manual instrument with A.C. buzzer for signal	Yes (
10. Suspended handset type telephone without induction coil-capacitor or signal. For use with desk set box	Yes (
11. Standard desk telephone in modern styling	Yes (
12. Standard "battery saver" desk telephone with 2-step hookswitch. mits subscriber to monitor party line	Yes (
13. High-efficiency desk telephone with 10 DB more gain than stan model	Yes (
14. High-efficiency desk telephone with 2-step hookswitch	Yes (
15. Desk set box for use in making a 2-piece set	Yes (
16. Extension bell box using ringers or buzzer. Commonly used with telephone	Yes (
17. 2-line telephone with hold feature on both lines. Third line provide intercom or local PX service	Yes (
18. Standard type desk telephone with push or twist type key	Yes
19. Multi-line telephone used with "6K System" has 6 keys: 1 for ho 5 for central office, PBX, intercom, or private lines	Yes
20. Hands-Free telephone. Can be used "hands-free" or as conven instrument	Yes
21. Electronic telephone for locations with high noise levels	Yes
22. Pay station telephone	No
23. Desk set telephone less ringer, less coil-capacitor unit	Yes
24. Colored telephones in 8 colors	Yes
25. Desk set convertible to wall telephone	Yes
26. Colored telephones less ringers	Yes

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Yes (950)	Yes	Yes
Yes (1248)	Yes	Yes
Yes (1258)	Yes	Yes
Yes (1268)	Yes	Yes
Yes (1270, 1272)	No	No
Yes (1532, 1532-M)	No	Yes
Yes (1533, 1533-M)	No	No
Yes (1533-MK)	No	No
Yes (1534)	Yes	Yes
Yes (1543)	No	No
Yes (2-1543)	No	No
Yes (1543-W)	No	Yes
Yes (2-1543-W)	No	No
Yes (1560)	No	No
Yes (1561)	No	Yes
Yes (1573)	No	No
Yes (1574)	No	No
Yes (1575)	No	No
Yes (1584)	Yes	No
Yes (Gai-Phone)	No	No
No	Yes	No
Yes (1544)	Yes	Yes
Yes	Yes	Yes
Yes	No	No
Yes	Yes	Yes

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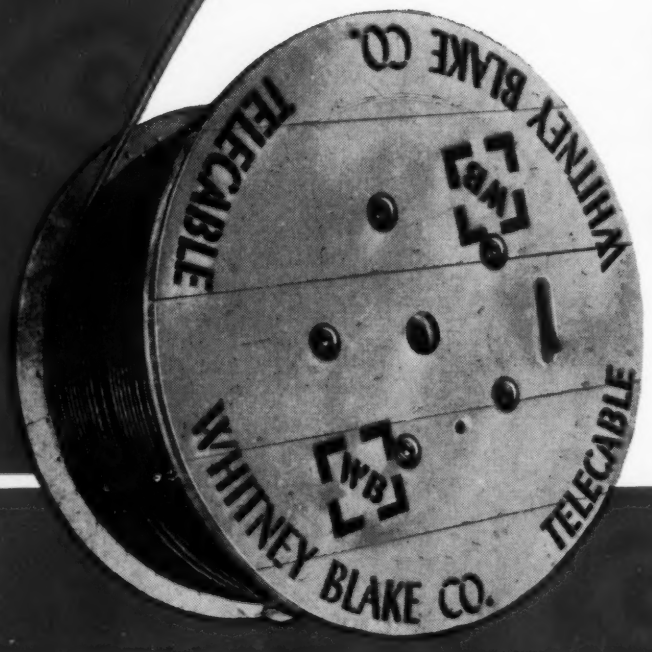

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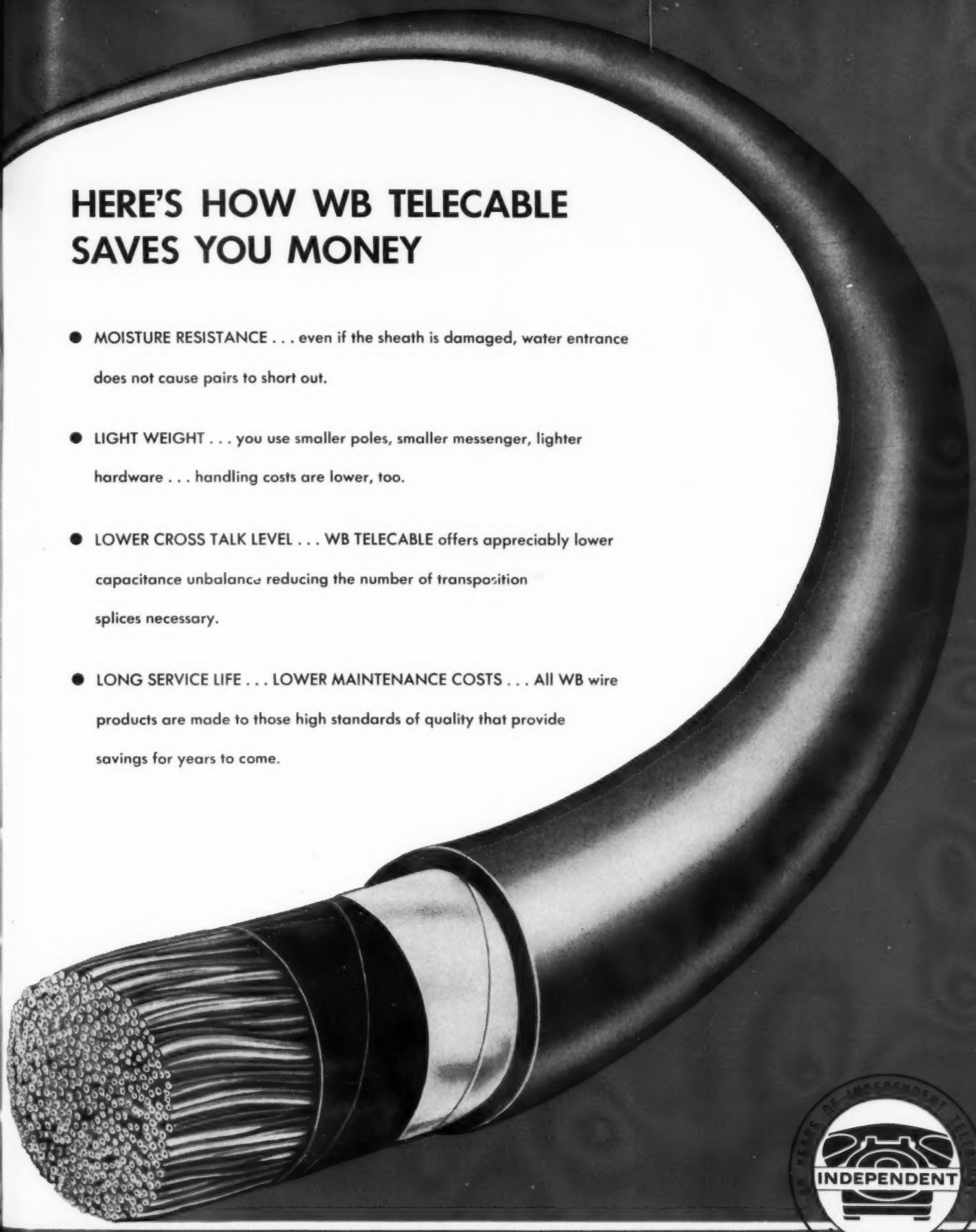

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For more detailed information on any of these systems ask your Kellogg representative.

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FLASHES AND PLUGS

BACKFIRE. A practical joke was turned upon the joker recently by the victim, a Milwaukee man.

Skiing near Wausau, Wis. recently, this unlucky gentleman had broken an ankle and is still hobbling around on crutches. The accident seemed to strike some of his friends as extremely funny and one of them went so far as to put a classified ad in the Sunday paper under his name and telephone number, saying: "Skis cheap."

The telephone calls started and the family hadn't the slightest idea what it was all about. Then it occurred to them that they did have some old skis in the basement which hadn't been used for several years and this seemed like a golden opportunity.

So they sold the old skis and now they are enjoying the "joke" as much as their still unidentified benefactor.

•

TELEPATHY. E. D. Peschel of Southwestern Bell Telephone Co., writes that a Methodist minister vouches for the story about the country boy in east Texas who asked how to place a call over a town telephone. Accustomed to the old magneto type of instrument, he was puzzled as to how to reach the operator over a telephone without the crank.

"Knock on the wall three times and lift the receiver," his city friend mischievously said. And from then on the rustic Romeo pondered on the acute hearing of an operator able to hear a knock that far.

•

BACKWARD LOOK. Back in 1901 the fact that the British Post Office had decided to place a cable from Holyhead to Ireland, 56 miles, caused great excitement, recalls The Bell Telephone Co. of Canada's *Blue Bell*.

It was then the longest submarine telephone cable in the world. One cable containing three pairs of wires was used!

•

PHANTOM ON THE LINE. A Pasadena, Cal. subscriber complained to the telephone company about the constant ringing of an unseen telephone outside his window.

A lineman climbed a pole outside the window and found a woodpecker inside a transformer box busily tapping on the metal.

•

WAY OUT. A partial payment received by a service representative in a city in the South had a note attached—"See you later alligator, for the balance of my bill."

Northwestern Bell magazine reported the service rep hopes that the cat drops his line long enough to "square" his account.

CHANGE OF ADDRESS

Please notify your local postmaster and Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

April 6, 1957

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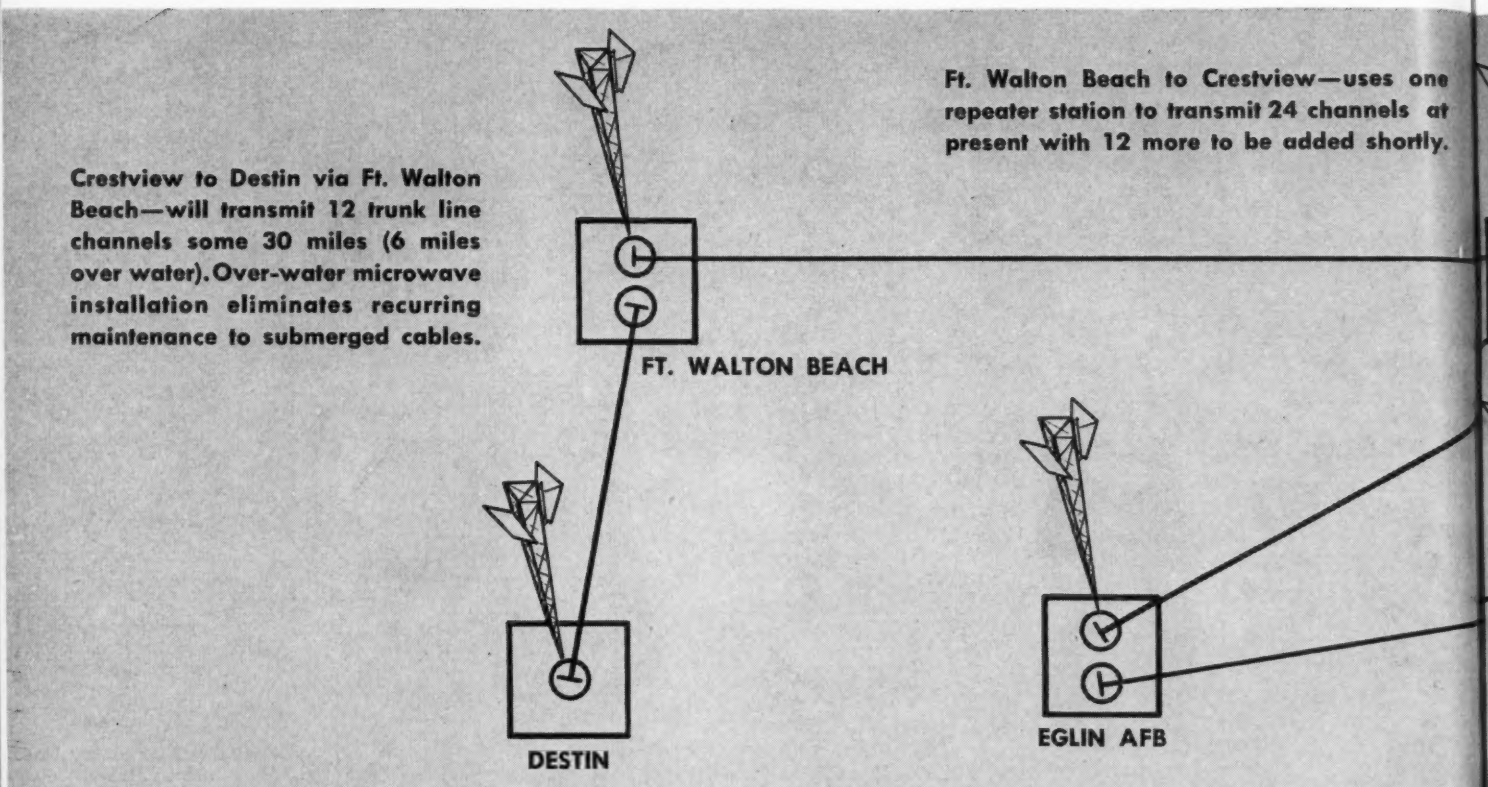
Crestview to Destin via Ft. Walton Beach—will transmit 12 trunk line channels some 30 miles (6 miles over water). Over-water microwave installation eliminates recurring maintenance to submerged cables.
Ft. Walton Beach to Crestview—uses one repeater station to transmit 24 channels at present with 12 more to be added shortly.
FT. WALTON BEACH
DESTIN
EGLIN AFB

Progressive Southeastern Telephone Company Repeatedly Specifies Philco Microwave In Dynamic Expansion Program

On the basis of proven reliability, economy and efficiency, Southeastern Telephone Co. selected Philco Microwave Equipment . . . has it in operation . . . and is installing more.

Multiple voice channeling, plus completely automatic dial system switching eliminate the need for manual switchboards at Destin and Ft. Walton Beach. Fallen transmission lines and service interruptions due to turbulent weather are a thing of the past. The need for submerged cable in the 6-mile over-water hop from Destin to Ft. Walton Beach has been eliminated entirely.

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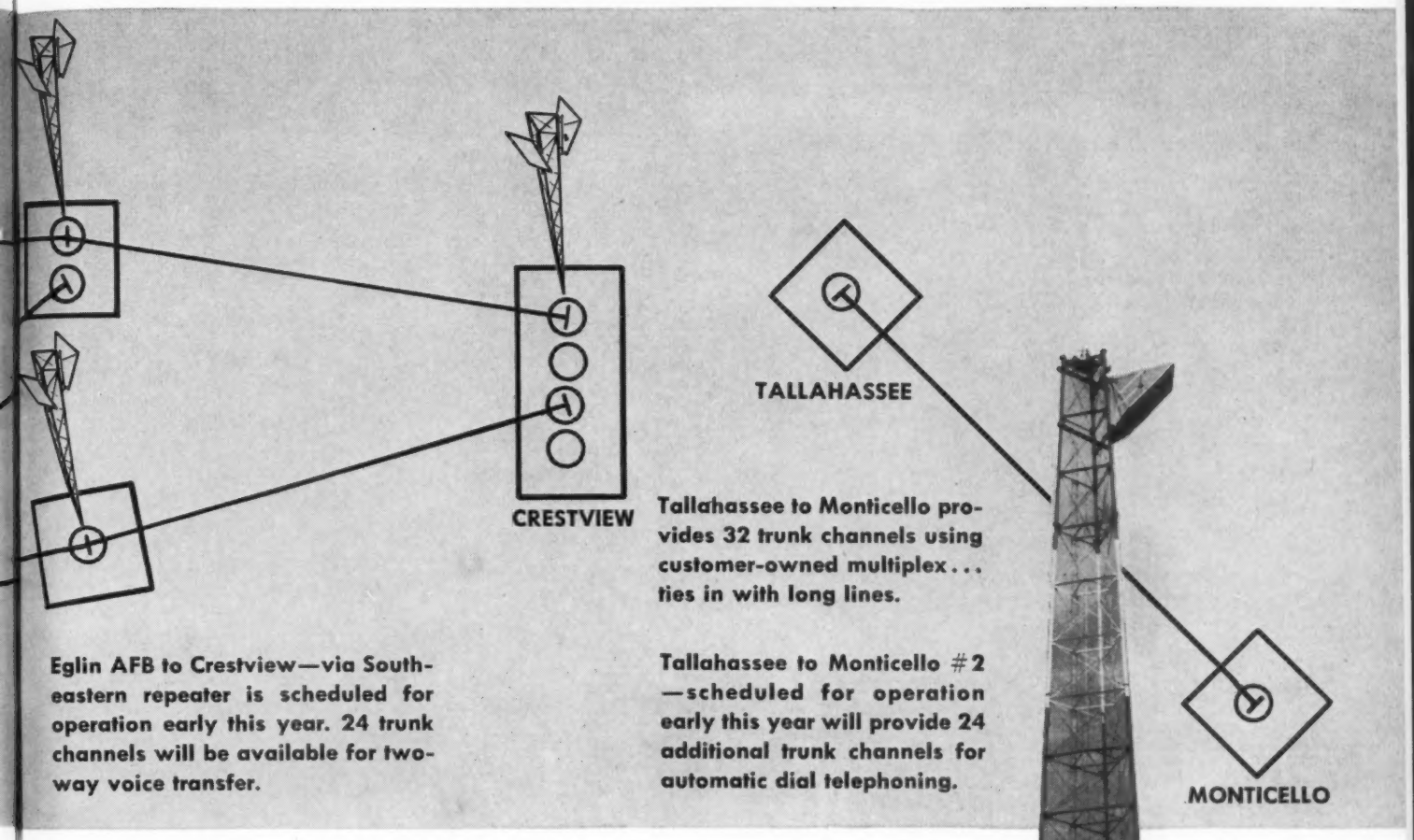

Eglin AFB to Crestview—via Southeastern repeater is scheduled for operation early this year. 24 trunk channels will be available for two-way voice transfer.

Tallahassee to Monticello provides 32 trunk channels using customer-owned multiplex... ties in with long lines.

Tallahassee to Monticello #2—scheduled for operation early this year will provide 24 additional trunk channels for automatic dial telephoning.

Linking its central toll center at Crestview to *Ft. Walton Beach, Eglin AFB* and *Destin* with low cost, automatic dial telephone service, Southeastern Tel. operates a network of Philco multiple-channel microwave trunk line carriers. Multiple trunkline switching at Destin and Ft. Walton Beach centrals is completely automatic.

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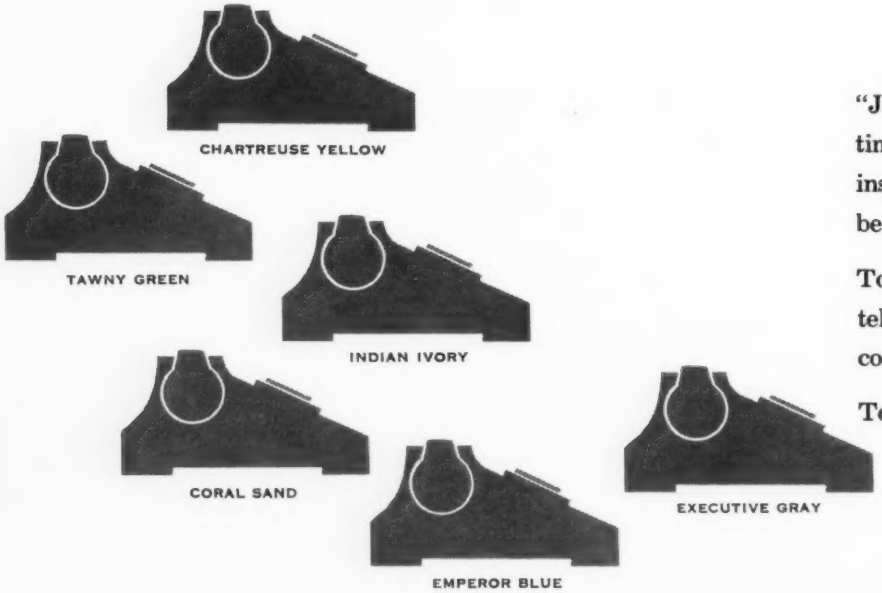
NORTH COLOR-TONE TELEPHONE



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"Junior" is growing up in an age of color! By t time he grows up and orders his first telepho installed, all residential and most office phones w be in colors. But that's twenty years from now.

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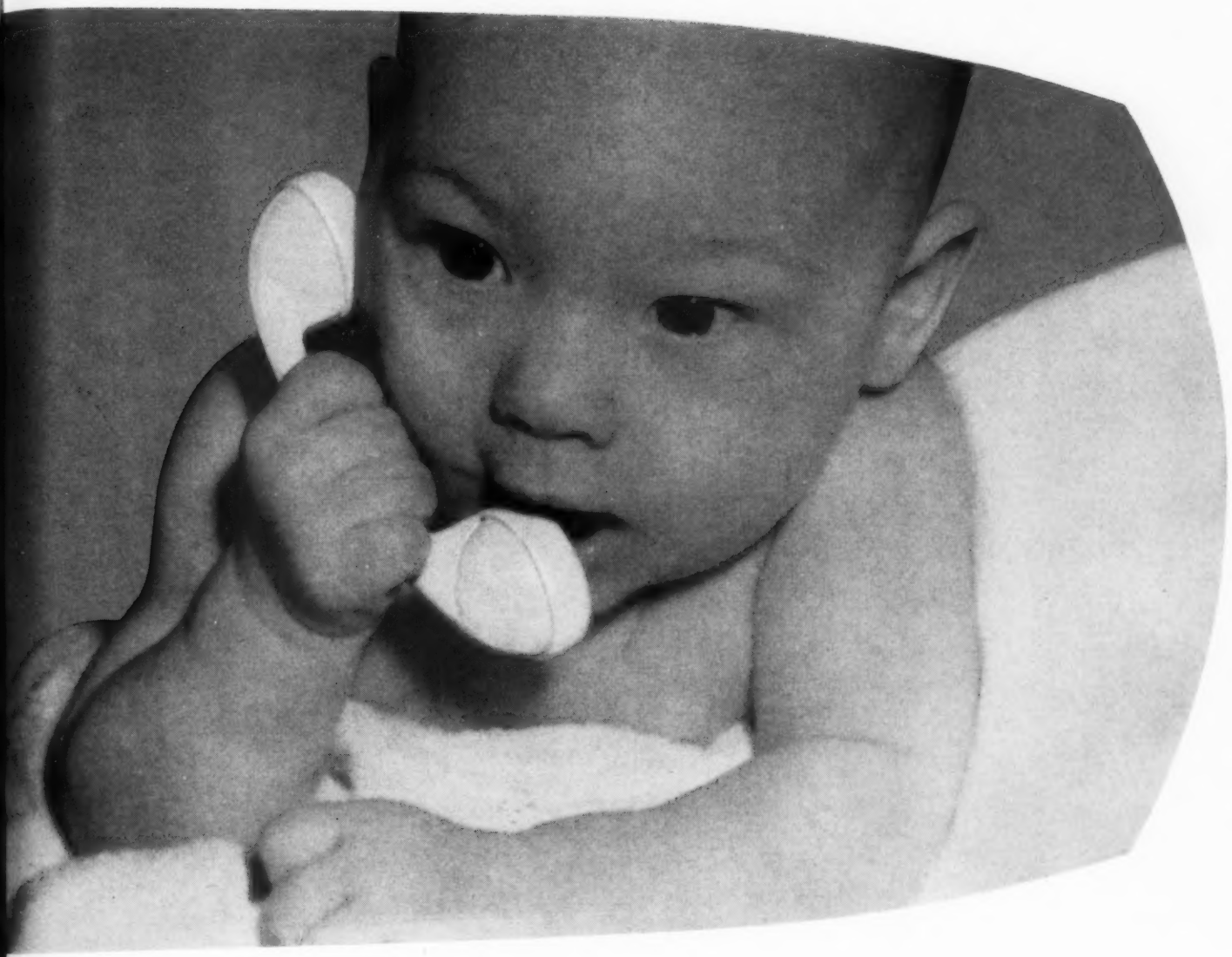

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phones from stock—in a choice of Richland Red, Chartreuse Yellow, Tawny Green, Indian Ivory, Coral Sand, Emperor Blue, and Executive Gray.

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The North Color-Tone telephones are the finest telephone instruments you can offer your subscribers—in transmission, in reception, in color styling!

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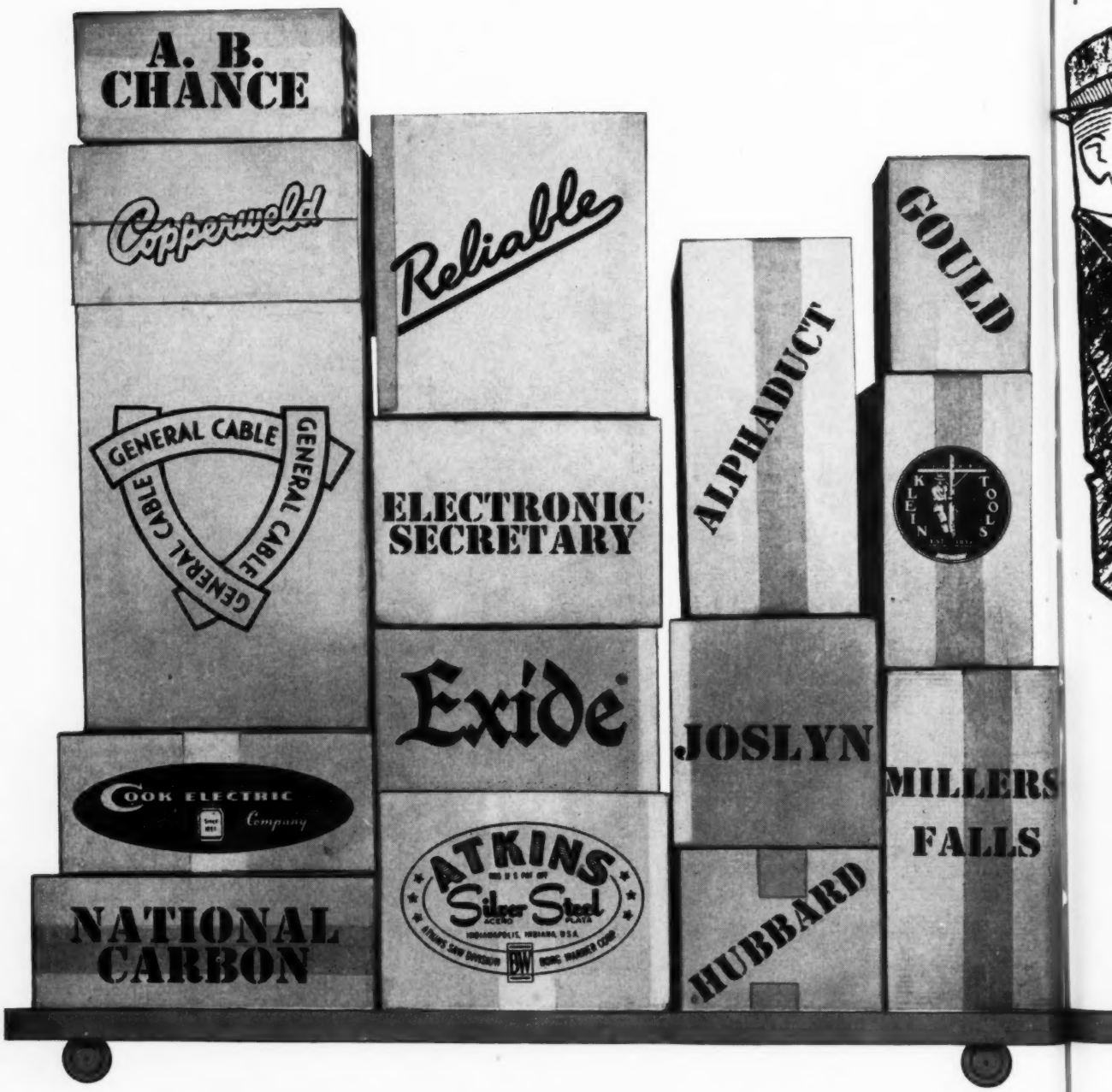

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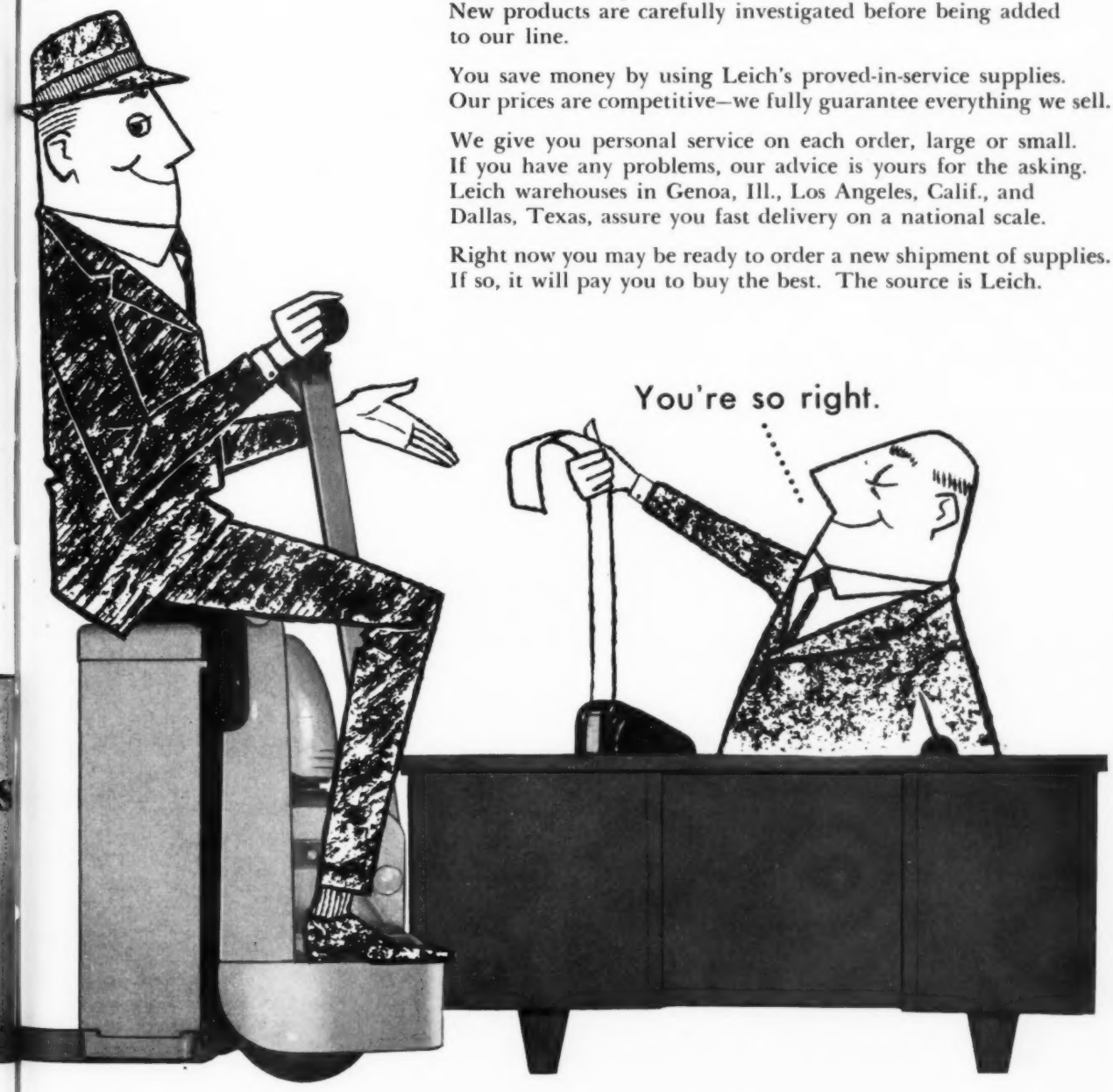

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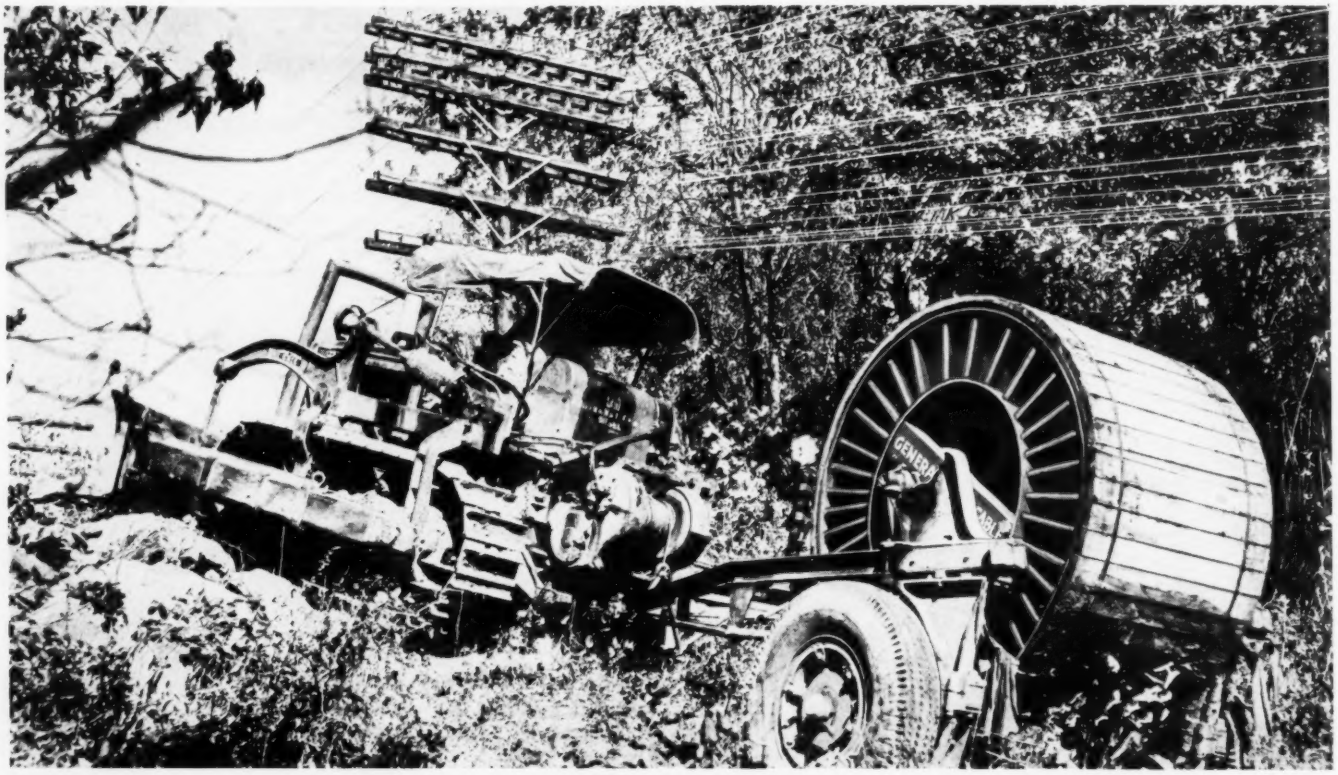

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

REA Telephone Advisory Committee meets in Washington. FCC proceedings to continue. AT&T Long Lines asks FCC to recognize utility function of mobile telephone service.

REA ADMINISTRATOR David A. Hamil held an interesting meeting in Washington, D. C., on Mar. 25 and 26 with his Telephone Advisory Committee. The purpose of the meeting was to consider possible changes in the security requirements for REA telephone loans and the cost of engineering for telephone systems to be financed by such loans. No basic changes in policy materialized, but the meeting did get around to making procedural and routine recommendations on four topics which would be of interest to borrowers.

The first and principle topic on the agenda was the question of nailing down the details of equity requirements. The second dealt with the report of a sub-committee on engineering costs, stressing ways and means for spreading the thin and expensive available supply of engineering talent over a wider area.

The third dealt with competitive bidding on the purchase of equipment by borrowers from manufacturers and suppliers. The fourth point on the agenda dealt with the question of making REA officials and other staff personnel available for industry and other meetings of interest to the borrowers.

Before going into the result of the committee's consideration on these four matters, it might be noted that REA Administrator Hamil took occasion to direct attention to two important announcements affecting the REA telephone program. One of these was the disclosure, by official estimates (U. S. Department of Agriculture release, Feb. 26, Crop Reporting Board, Agriculture Marketing Service), that for the first time in history over one-half of the farms in the United States now have telephone service. This was shown in an annual survey made in 1956 by the Agriculture Department Crop Reporting Board.

According to this survey 51.9 per cent of the farms, or about 2½ million, had some type of telephone service on July 1, 1956. This compares with 49.2 per cent in 1955 and 38.2 per cent in 1950. The percentage of American farms with telephones has increased steadily since 1940 when only 25 per cent of the farms had telephone service.

However, in the 20 years prior to 1940 the percentage of farms with telephones had declined sharply. The increase of 2.7 percentage points between 1955 and 1956 was the greatest on record for any one year since annual data became available. The area distribution of these telephones was shown as follows:

Percent of Farms with Telephone Service, United States, July 1 Selected Years 1912—1956

Year	*Per Cent*	*Year*	*Per Cent*
1912	29.4	1949	36.4
1920*.....	38.7	1950*.....	38.2
1930*.....	34.0	1951	39.6
1940*.....	25.0	1952	41.8
1945*.....	31.8	1953	44.2
1947	33.7	1954	46.7
1948	34.6	1955	49.2
		1956	51.9

* Bureau of Census, Department of Commerce.

The other announcement made at the REA telephone press conference on Mar. 26 at Administrator Hamil's office dealt with a proposed increase in REA staff assigned to its telephone loan activities. Administrator Hamil disclosed that if the budget now before Congress is approved without cutting, REA will be able to add 66 new members to its staff.

The point of special interest here is that *60* of these new people will be assigned to the telephone loan program. This shows how much the REA activities are orienting toward the telephone loan branch of its program these days, as compared to rural electrification, which heretofore has occupied so much of its time, attention, and funds.

Equity Requirements. The REA Telephone Advisory Committee, as already stated, made no recommendation for basic changes regarding the amount which REA borrowers will have to invest of their own funds or property in support of loan applications.

A policy bulletin to be issued in the next few days will cover the recommendations as to suggested provisions for both the cooperative and commercial company borrowers. These deal with methods of determining "net worth" of a borrower.

This is a reference to "net worth" as a basis for mortgage control of the borrower by REA. Certain loopholes in mortgage and loan documents would be plugged up in order to give REA more definite controls. And the question of area coverage for telephone service by both types of borrowers will also be covered.

Report on Engineering Costs. A subcommittee on engineering costs submitted a report which suggested some "do it yourself" steps which borrowers might take, in order to lower their engineering costs. It was stressed, however, that there should be no sacrifice or departure from adequate engineering standards of construction and design.

XUM

Competitive Bidding on Equipment. While the borrowers should continue to use competitive bidding, under sealed bids, for original installations of equipment on all substantial jobs, it was recognized that minor additions or alteration jobs might call for direct negotiation with suppliers. This is because the same type of equipment would have to be used in additions to original installations, and would probably come from the same source.

REA Approves Five Loans Totaling $2,821,000

Rural telephone systems in Alabama, Florida, Minnesota, Missouri and Texas received loans totaling $2,821,000 from the Rural Electrification Administration the week of Mar. 18, the U. S. Department of Agriculture announced on Mar. 26. These loans will mean new and improved service for 4,348 subscribers, including service for the first time to 2,676 farm families and other rural subscribers in 14 counties. Details of the loans follow:

Western Telephone Service, Inc., Vega, Tex.; $700,000, first loan (Mar. 21).

The new borrower plans to use these funds to improve service for its 848 present subscribers, and to add facilities to serve 1,067 farms and other rural subscribers. The company consists of 207 miles of line, a magneto exchange at Channing and automatic exchanges at Adrian, Fritch, Hartley, Sanford, Vega and Wildorado.

Proposed improvements include replacing the present Channing magneto facilities by the Fritch automatic switchboard in a new building. The company plans to use the Adrian building and automatic facilities in place and to improve facilities of the five remaining exchanges by constructing two new buildings and installing three new automatic switchboards. In addition, a new building is planned in Vega to house headquarters facilities and an attended switchboard which will provide operator service to the Adrian, Channing, Hartley and Wildorado exchanges. Similar service will be furnished to the Fritch and Sanford exchanges by the Southwestern Bell Telephone Co.

Western Telephone Service recently acquired 55 miles of toll line from the Southwestern Bell Telephone Co. which was serving 7 toll stations.

A portion of the loan will be used for refinancing the borrower's existing indebtedness.

J. T. Richetts is president and manager of the Western Telephone Service.

*

Monroeville (Ala.) Telephone Co., $412,000, second loan (Mar. 22).

These funds will enable the borrower to provide service for the first time to 834 new rural subscribers, and to improve service for 252 existing subscribers. The existing subscribers are now receiving magneto service from the Beatrice Telephone Co., and the Pine Apple Telephone Co. The Monroeville company plans to acquire these systems with loan funds.

New construction in the additional area will include an automatic central office in Pine Apple, the installation of new automatic facilities in the existing Beatrice building, and 181 miles of line.

In addition, a portion of the loan will be used to convert the borrower's Monroeville common battery facilities to attended automatic operation, and to complete the system as authorized under the first loan.

The two loans to this borrower total $877,000 and will make possible dial service to 2,893 subscribers. The system will consist of 509 miles of line and automatic offices at Beatrice, Excel, Frisco City, Monroeville, Peterman, Pine Apple, Repton and Uriah. All are providing dial service except Beatrice, Monroeville and Pine Apple.

M. M. Kennedy is president and manager of the Monroeville Telephone Co.

*

North Florida Telephone Co., Live Oak; $1,113,000, second loan (Mar. 22).

These funds will be used to cover increased construction costs incurred since approval of the first loan, to provide facilities to 207 additional subscribers, and to meet the extraordinary demand for one-party, two-party and four-party lines.

The two REA loans to this company, amounting to $4,715,000, will enable it to provide new and improved service to 7,485 subscribers. This includes service for the first time to 4,303 subscribers in the area. The system will consist of 1,840 miles of line and 13 automatic exchanges.

Otto Wettstein, III, is the president of the North Florida company.

*

Runestone Telephone Association, Hoffman, Minn.; $350,000, fourth loan (Mar. 22).

The borrower plans to use this loan for automatic facilities to furnish new and improved service to 642 rural subscribers, including 204 now without telephones. The 438 existing subscribers are now being served through the Norcross, Tintah and Wendell magneto exchanges of the Wendell (Minn.) Telephone Co., a former REA telephone borrower. The Runestone borrower plans to acquire these facilities and convert them to automatic operation. New automatic central offices are scheduled to replace the three magneto offices, and 122 miles of new line will be added to the system.

REA loans to the Runestone association total $961,000, which will enable it to furnish new and improved service to 1,771 rural subscribers. The system will consist of 680 miles of line and seven exchanges. Those at Barrett, Donnelly and Hoffman already are in operation. The Kensington exchange was provided for in the third loan.

N. F. Nelson is president and Berdell Skogstad is manager of the Runestone Telephone Association.

*

Hartville (Mo.) Telephone Co.; $246,000, first loan (Mar. 22).

The borrower plans to use these funds to convert its magneto system serving 150 subscribers, to automatic operation, and to serve 368 farm families now without telephones.

Construction proposed by the company includes an automatic central office at Hartville.

O. K. Furr is president and manager of the Hartville Telephone Co.

REA Officials at Borrowers Meetings. It was recommended that REA personnel or officials be provided for meetings where invited and wanted, and if there is a specific request. If REA feels its staff can make a contribution to the meeting REA will be glad to accommodate.

It was thought that some effort should be made, however, to consolidate state association and REA borrower meetings (if in the same area or region) to cut down duplication of same REA personnel going out of the office. It was suggested that meetings, if not held under one roof could be held on consecutive days so that a return trip would not be required of REA people. Co-ordination was sought for minimum traveling and in view of REA's budget and manpower limits.

Accelerated Depreciation

The deadline for comments passed Mar. 15 on a proposed FCC rule which would liberalize depreciation accounting for telephone companies. The proposed rule, initiated by a petition from General Telephone System, would amend the FCC's Uniform System of Accounts for Class A and Class B telephone companies, so as to provide deferred tax accounting for the difference between actual income tax liability, lowered because of the use of accelerated depreciation deductions, and the higher tax payments which results when lower ("normalized") straight-line tax deductions are used.

Adverse criticism of the proposal has come from the Communications Workers of America and from some state commission sources, although most state commissions think otherwise. Interested parties have until Apr. 15 to reply to comments already filed.

The FCC will then announce the date of oral argument if it appears that the comments received warrant an open hearing. The Federal Power Commission already has approved of "normalized" accounting for tax payments by gas and electric utilities, in the so-called "Amere case" (15 PUR3d 339), now pending on appeal to the U. S. Circuit Court of Appeals for the District of Columbia.

In the preceding issue of this department (TELEPHONY, Mar. 30) a roundup of state commission practices regarding the use of accelerated depreciation for both accounting and rate-making was included. That indicated that the great majority of state commissions permit so-called "normalized" accounting for accruing tax payments, under the liberalized depreciation provisions of the tax law.

REA's 17-member telephone advisory committee met in Washington, D. C. on Mar. 25 and 26 to review and make suggestions for conduct of the agency's rural telephone program. Here REA Administrator David A. Hamil (right) listens to a discussion of three of the members. Left to right, Riggs Shepperd, manager of the Southwest Texas Telephone Cooperative of Hondo, Tex.; Orla L. Moody, staff engineer, American Telephone & Telegraph Co., New York; and William C. Henry, president of the Northern Ohio Telephone Co., Bellevue, O., and chairman of the Small Company Committee of the United States Independent Telephone Association.

Only a few (Maine, Pennsylvania, Wisconsin) insist on their public utilities accounting for actual tax payments, regardless of the tax computation method used. The FCC proceedings on the proposed rule will continue for about another month because of consideration of so-called "reply brief." After that the FCC will permit the proposed rule to become final with or without change.

Mobile Service

Another matter of importance to the telephone industry, pending before the FCC, is the proposed tariffs of the Long Lines Department of the American Telephone & Telegraph Co. for the rendition of mobile telephone service as a regular part of its telephone long distance facilities.

The Bell System thus asks the FCC, at the national or interstate level, to recognize the utility function of mobile telephone service, along the same line as the California commission has recognized it at the state level. (See TELEPHONY, Feb. 16 and Mar. 9.)

It is interesting to note that since the California Public Utility Commission ruled in favor of the telephone companies on this point, another state commission has rendered a similar opinion. This was the Missouri Public Service Commission, which recently approved proposed tariffs filed by the Southwestern Bell Telephone Co. for the use of mobile telephone service in connection with a commercial paging service.

As in the California case, the Missouri commission held that doctors, public officials and others who have emergency calls and other special needs for instantaneous paging communication service have a right to be provided with it by their local telephone company.

As readers are aware, such paging devices are actually small receiving sets which can be carried in the pocket or elsewhere on the person of the subscriber. When he is wanted for an emergency, the device responds to a radio signal, after which the subscriber can get in touch with the party calling for his attention.

Incidentally, this writer made a slip in referring to the California commission decision in this department, issue of May 9, when he referred to the availability of "tie-in" service for mobile telephone subscribers with the regular land-line system of the telephone company.

Actually, the California commission

(Please turn to page 42)

XUM

Insulated Parallel Circuit With Air Dielectric For Rural Telephone Service

By W. T. Smith • C. R. Ballard • R. S. Bailey*
Rural Electrification Administration

THE NEED for open wire circuits in rural areas will prevail for the foreseeable future. The use of bare wire for such circuits has many disadvantages which can be offset by using individually insulated wires. In addition, insulated wires would permit changes in design with substantial additional benefits. Field trial data with the insulated wire and new types of support are encouraging to date. Field trials on an increasing scale are progressing.

Net increases in first cost because of the present costs of insulating the wires is an obstacle to widespread use of this type of construction in spite of the tangible and intangible benefits in operation and maintenance.

While first costs comparisons are not favorable, it is expected that there will be many situations where elimination of hits, improvement in the leakage characteristics, resistance to corrosion and freedom from effects of foliage will easily prove it in over bare wire. Experience in these situations will permit determination of specific information on savings in operation and maintenance.

It is clear that the differences in cost are sufficiently close that only minor savings in costs of operations and maintenance are needed for insulated wire to be more economical than bare wire on an annual cost basis.

I. *The Need for Circuits with Air Dielectric*—There have been many papers presented at this and other symposiums describing the use of plastic insulating materials in telephone plant items such as plastic cable, multi-pair distribution wire, etc. These are important developments and have been major contributions to the telephone industry. These items are in use at many places on systems of REA borrowers.

However, as shown in *Table I* in a breakdown of outside plant construc-

*This paper was presented at the 1956 Signal Corps Symposium on Wires and Cables.

Breakdown of Outside Plant Construction of REA Borrowers

Total Pole Line Miles Makeup		*Open Wire Pole Line Miles Makeup*	
Open wire—separate poles	66%	One Circuit	68%
Open wire—joint poles	26%	Two circuits	13%
Cable	5%	Three circuits	7%
Other	3%	Four circuits	4%
	100%	Five and more circuits	8%

Table I

DC LOOP RESISTANCE IN OHMS AND ESTIMATED ATTENUATION IN DB PER MILE

Open Wire (R-1 Type Transpositions)	Wire Diam.	Mat'l.	DC Loop Res Ohms @ 68° F.	FREQUENCY IN KILOCYCLES 1 Dry	1 Wet	50 Dry	50 Wet	100 Dry	100 Wet	150 Dry	150 Wet	200 Dry	200 Wet	400 Dry	400 Wet
(1) Bare, Copperweld, 12-inch Spaced (Point transposed)	.080-30%	CW	54.5	.26	.26	.41	.44	.43	.48	.44	.51	.45	.55	.53	.70
(2) Insulated Copperweld, Close Spaced* (Tandem transposed)	.080-30%	CW	54.5	.36	.36	.63	.64	.65	.67	.67	.70	.69	.72	.79	.87
(3) Insulated Steel, A Galvanized Close Spaced* (Tandem transposed)	.109-135	Steel	76.5	.40	.40	3.88	3.89	5.05	5.07	5.83	5.86	6.60	6.63	7.68	7.76
Twisted Pair Wires and Cables															
(4) Multipair Distribution Wire** (B Rural Type, .064 Cap. when dry)	.036	Copper	85.0	1.1	1.5	3.2	5.0	4.1	7.0	5.0	9.0	6.0	11.0	8.5	18.0
(5) 19 Ga. Paper Type CNB (.084 Cap. dry core)	.036	Copper	85.0	1.3	—	5.0	—	6.5	—	7.8	—	9.0	—	12.9	—
Parallel Extruded Pairs															
(6) Copperweld 14-Gauge	.064-30%	CW	87.0	1.1	1.5	4.0	7.6	4.3	8.9	4.4	9.9	—	—	—	—
(7) Steel—A Galvanized	.083-135	Steel	119.0	1.3	1.8	—	—	20.6	—	27.1	32.3	—	—	—	—

NOTES

* Spacing is 4" at one end of span and 1" at other end. Insulation is 15 mil polyethylene.

** Data from "Transmission Characteristics of Rural Distribution Wire at Audio and Carrier Frequencies" by John A. Brazee, Signal Corps Symposium, Asbury Park, New Jersey, December 1955.

Table II

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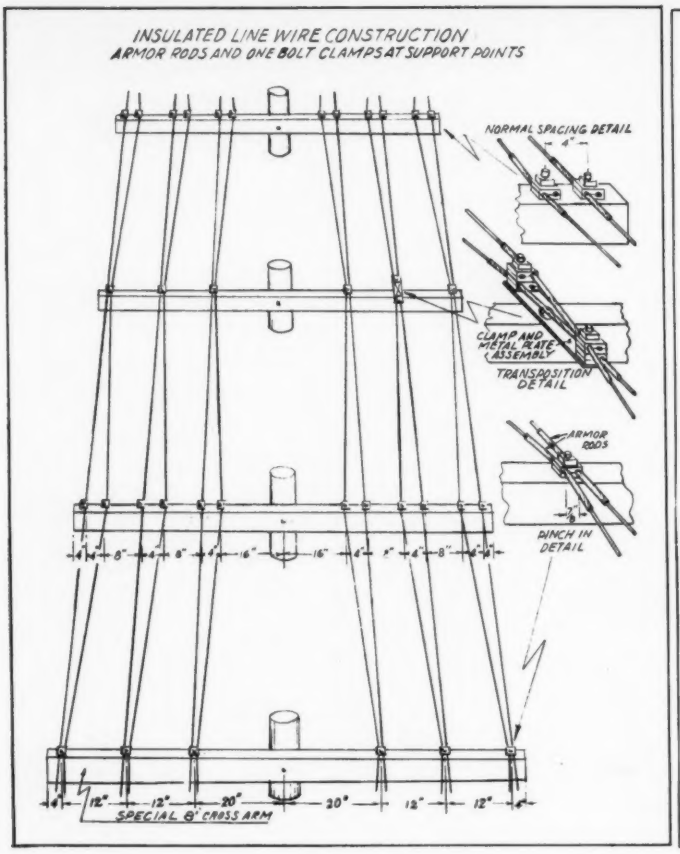

Fig. 1

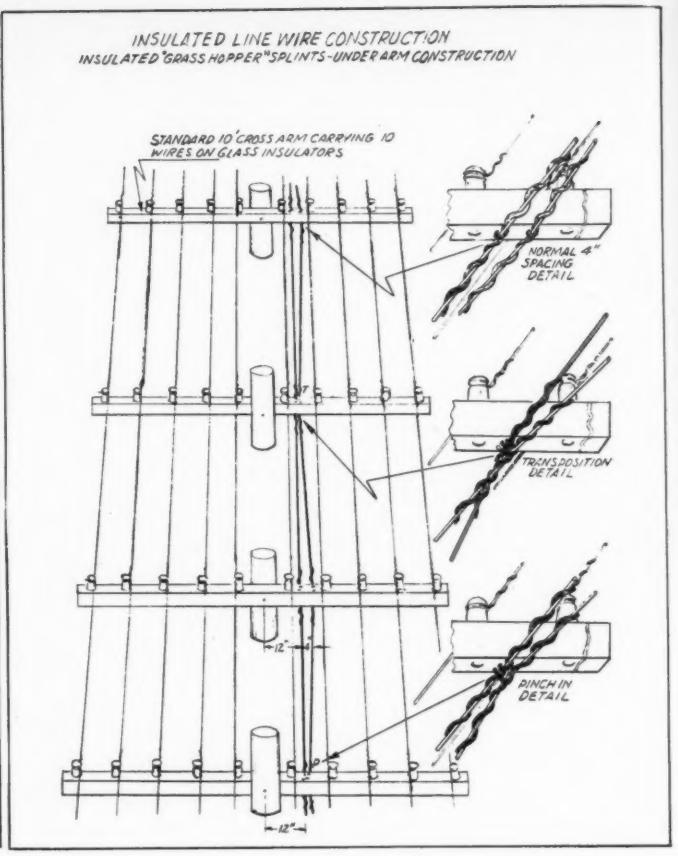

Fig. 2

tion of REA borrowers, the opportunities to provide a multiplicity of circuits initially are distinctly limited, the primary need being for mechanically and electrically improved facilities for smaller leads.

It can be seen that the primary requirements are for open wire lines, 23,000 miles out of 25,000 during 1955 and, of these, almost 16,000 miles were for one circuit. The predominance of open wire is the result of the nature of the areas served. The average borrower serves a large area with low subscriber density. This calls for small numbers of circuits over relatively long distances.

Open wire is the best available plant today for such conditions if economic and transmission objectives are to be met. Open wire circuits, because of their wide spacing and air dielectric, have relatively low attenuation at voice and carrier frequencies.

In the past few years, developments in subscriber carrier equipment have been promising and rapid. Carrier systems with three to 10 channels per pair are now available. This forces increased attention to carrier frequency characteristics of telephone plant.

With this in mind, REA has recommended that on each multi-circuit open wire lead, at least one circuit be Copperweld. By making this provision for carrier initially at very minor expense, the ability to employ carrier to expand facilities is obtained.

From the present trend in carrier development with transistors destined to replace vacuum tubes, it now seems highly probable that carrier channels can be justified over much shorter distances, say in the order of 5 to 6 miles.

As many of you know the reason for this is that all present-day evidence points to the fact that transistor life can be expected to be anywhere from 10 to 20 times that of current day vacuum tubes.

The cost of replacing vacuum tubes, in which the cost of time of travel transcends the tube cost itself, plus the greatly reduced cost of power, both pinpoint the urgent need for carrier equipment manufacturers to concentrate on transistorized carrier systems.

Out of this comes a corollary requirement to improve the reliability of the open wire plant in every practicable way, since open wire has inherently low attenuation at carrier frequencies —as a result of the air dielectric.

Table II presents estimated attenuation in db per mile at voice and carrier frequencies for open wire, both bare and insulated conductors, as well as for cables and parallel and twisted pairs of wires.

The close spaced insulated open wire is not as good for carrier transmission as the bare wire, due to the reduced spacing between wires and to the assumed losses in the extraneous foreign deposit on the insulation, but the degradation is nominal.

The variation between dry and wet weather conditions is relatively small. The effect of the absence or near absence of the air dielectric on the twisted pair cables and parallel extruded pairs is pronounced, even at 1 kc, and becomes quite overwhelming at the higher carrier frequencies.

II. *Experience with Insulated Open Wire Plant.* In a paper presented at this symposium in 1954, by REA authors (TELEPHONY, Jan. 8, 1955), the case for insulating the wires of rural open wire plant was discussed in detail. The advantages can be summarized as follows:

(1) Shorts and crosses due to midspan hits are eliminated.

(2) Resagging requirements after storm loading becomes a problem of crosstalk and noise control rather than of hits.

(3) DC insulation resistance is expected to be high, with less variation with weather.

(4) Wires will be less subject to corrosion and the deleterious effects of salt spray.

(5) Insulated wires will permit close spacing, with consequent reduction in

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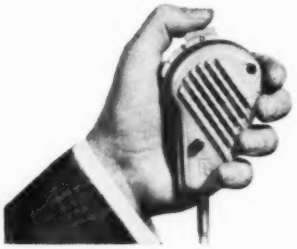

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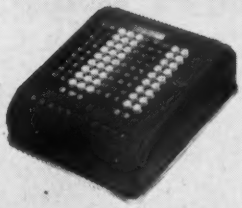

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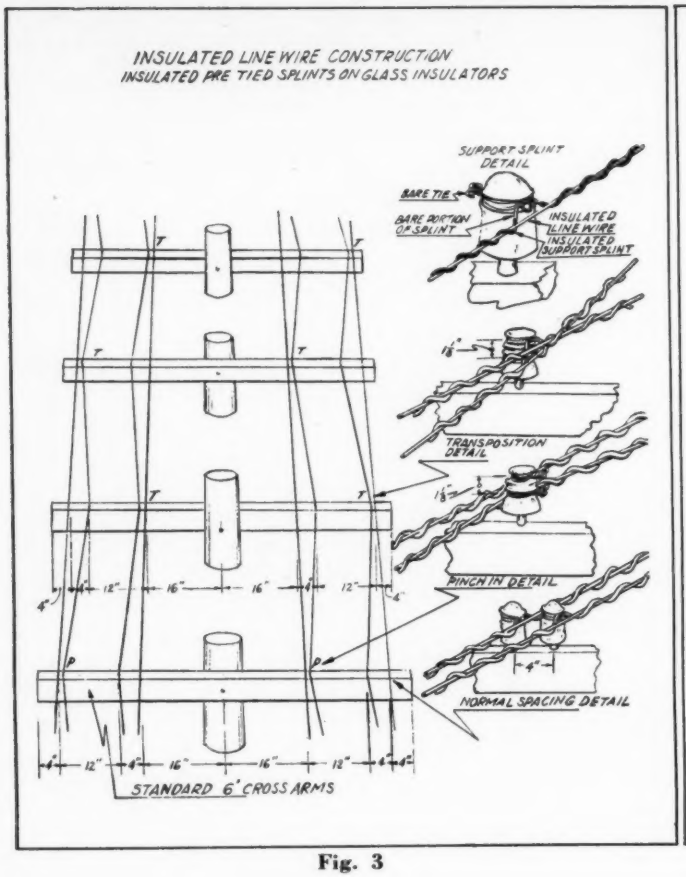

Fig. 3

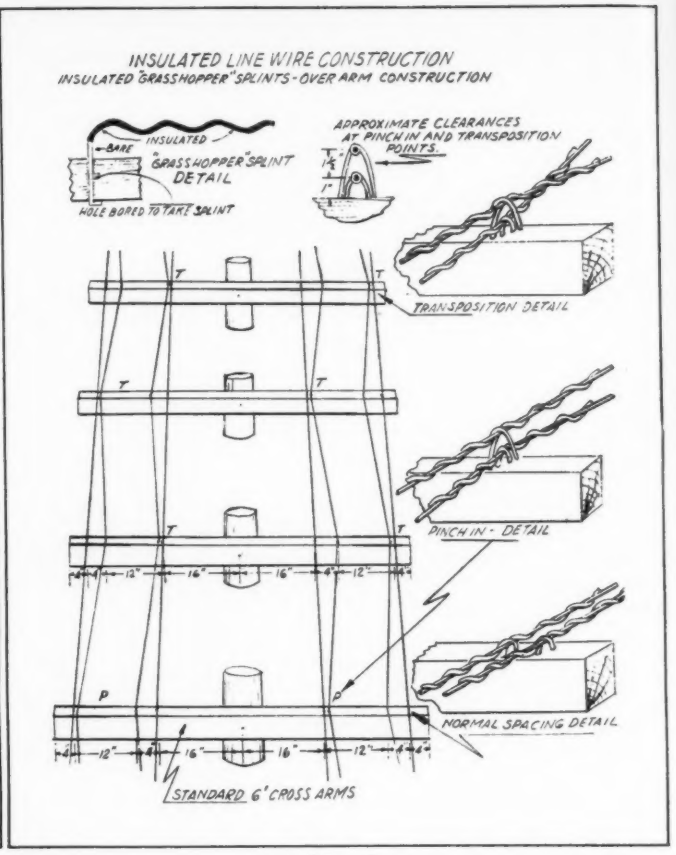

Fig. 4

length of crossarm. The close spaced insulated wires have higher attenuation than 12-inch spaced bare wires, but the attenuation swing between wet and dry weather conditions is lower with the insulated wire. Also, the increased spacing between pairs relative to the spacing of a pair gives more efficient control of noise and crosstalk.

(6) New and less expensive means for fastening wires at crossarms may prove satisfactory as a substitute for glass insulators and conventional ties.

Since 1954, field trials of insulated pairs have been made in various parts of the country. These trials included several types of support and utilized both 109—135 steel conductors and .080—30 per cent Copperweld. Some 20 miles of all insulated plant have been installed in Minnesota, North Dakota, Indiana and Louisiana.

In Indiana, Minnesota and North Dakota, the trials of supports included two types: (a) Assemblies of bare armor rods are shown in *Fig. 1*, and (b) insulated "grasshopper" splints in underarm construction as shown in *Fig. 2*. Span lengths averaged about 350 feet.

Separations were 4 inches in Minnesota and North Dakota and 12 inches in Indiana and Louisiana. In Louisiana, Grade A galvanized 109—135 steel and .080—30 per cent Copperweld were used. The circuits were installed on pole lines that were severely exposed to salt fog from the Gulf of Mexico. Normal plant used in the area was 104 hard drawn copper because of severe corrosion experienced.

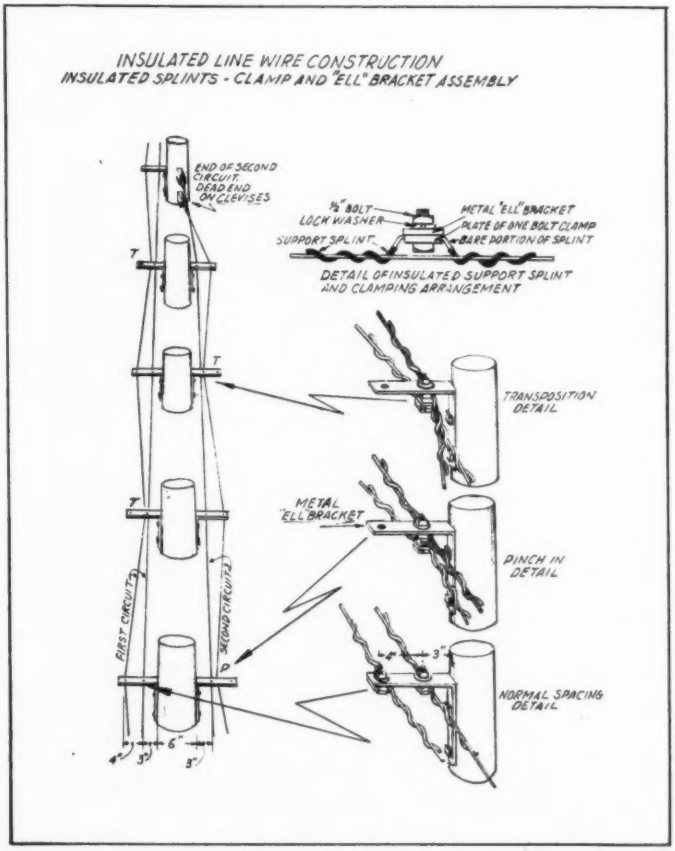

Fig. 5

With the short pole spans, the matter of support fixtures was not particularly important, the trial being primarily a test of the corrosion pre-

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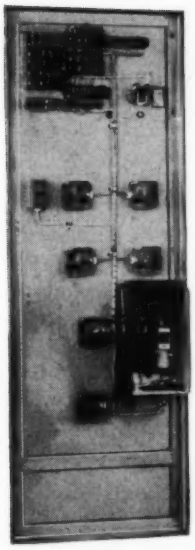

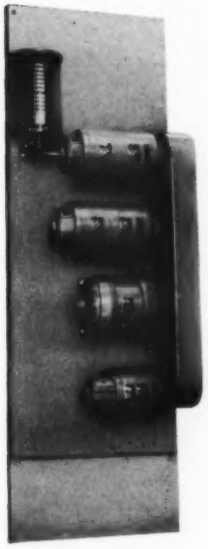

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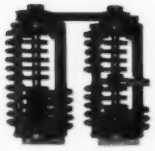

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ventative characteristics of polyethylene coatings. Splices were taped and all conductor surfaces protected.

The results of the trials have been encouraging in all respects. Except for an initial difficulty with the armor rods of *Fig. 1* which was cured by using one additional rod to provide a full circle of covering, no difficulties with the supports have been experienced.

The efficiency and economy associated with the insulated "grasshopper" splints demonstrated in the underarm trials of March, 1955 have spurred the use of insulated splints for supporting other types of plastic insulated line wire.

While experience with the wire and supports has only extended over a period of 18 months, the lack of any difficulties over this period provides sufficient confidence to warrant more extensive trials so that additional experience can be obtained on an accelerated basis.

Additional trials are being made in Kansas of pairs with one wire insulated and also of pairs with both wires insulated. In the trial with both wires insulated, standard 6-foot crossarms will be used for four-circuit leads, with insulated splints pre-tied to glass insulators as shown in *Fig. 3*.

The wires of each circuit are 4 inches apart at one pole and 1⅛ inches apart at the next pole for pinch-in or transposition. By staggering the pinch-in or transposition points for the two circuits on the same side of the pole and locating the points in the outer pin locations, a maximum separation between these circuits is obtained in a minimum of crossarm space. Climbing space is adequate for joint use poles. For separate pole line construction, a crossarm 16 inches shorter could be used.

It is expected that further trials will be made in areas where line hits, low dc insulation resistance or corrosion from salt spray are serious problems for bare open wire. Additional types of construction to be used are shown in *Figs. 4* and *5*.

Fig. 4 is quite similar to *Fig. 3* for four circuits, for use where span lengths do not exceed 350 feet. Instead of using glass insulators to support the line wires, insulated "grasshopper" splints will be used with overarm construction.

For separate pole construction not requiring more than two physical circuits, or joint use for one physical circuit, the arrangements of *Fig. 5* can be used where span lengths do not exceed 350 feet. Short L brackets are shown with one-bolt clamps holding the insulated pre-formed splints. This arrangement should also be attractive for carrier applications in cable overbuilds.

III. *Economic Considerations.* The economics of insulated open wire plant is, of course, a major consideration in its ultimate field of use. The limited experience available on this type of plant does not permit realistic estimates of relative maintenance costs as compared with bare open wire. Based on experience with other types of insulated plant, it is reasonable to assume a substantial reduction in maintenance costs.

We have set up in *Table III* a few tentative cost comparisons based on insulating .080—30 per cent Copperweld with 15 mils of polyethylene.

(Please turn to page 59)

ESTIMATED FIRST COST PER MILE FOR POLES, SUPPORT FIXTURES AND WIRE

Four Circuit Lead	Wire Diam. Mat'l	Poles/ Mile	First Cost	Remarks
(1) Bare Copperweld, 12-inch Spaced, 10-foot Arms (Regular Point Brackets)	.080-30% CW	19.5	$1,165	Basic cost for 4-circuit lead suitable for carrier application (for comparison with other plans).
(2) Insulated, Copperweld, Close Spaced, 6-foot Arms (Using "Grasshopper" Splints)	.080-30% CW	19.5	1,288	Cost of insulation estimated at $60/pair mile. In order that the cost of insulated wire construction be comparable with bare open wire construction, a reduction in installed cost of approximately $30/pair mile must be effected.
(4) 4-Pair 19-Gauge Multi-pair Distribution Wire (B Rural Type)	.036 Copper	18.9	1,012	An excellent tool for local distribution where higher attenuation, even at voice frequency is no problem. Cost would have to be burdened with over-build costs for carrier, if more than an entrance cable length of B rural type wire were involved.
(5) 26-Pair 19-Gauge Paper	.036 Copper	20.0	3,600	Same comments as for B rural type wire. The 26-pair size is shown to provide equivalent channels to those obtained with 20 carrier channels and 4 (3 or 2) physical O.W. circuits.
Single Circuit Lead				
(1) Bare, Copperweld, 12-inch Spaced, 2-Pin Arm	.080-30% CW	19.5	476	Basic cost for single circuit lead for comparison with other plans.
(2) Insulated, Copperweld, Close Spaced, L Bracket with Clamped Splints	.080-30% CW	19.5	530	Cost of 15 mil PE insulation estimated at $60/pair mile. To make total cost equal to that of bare wire, a further saving of $24/pair mile is required, in addition to the $30/pair mile previously referred to. Some savings in fixture and splint costs are a possibility.
(3) Insulated Steel, A Galvanized, Close Spaced, L Bracket with Clamped Splints	.109-135 Steel	19.5	509	Slightly lower in cost than .080 insulated Copperweld. Attractive for salt fog and corrosive atmospheres, also in windy and shade tree areas, where higher DC resistance and attenuation at carrier frequencies are no problem.
(6) Parallel Pair, Copperweld, 14-Gauge	.064-30% CW	18.9	545	Estimated greater cost of this wire to REA borrowers, together with its unsuitability for carrier and its signaling limitations, does not make it attractive for general use as line wire in REA rural areas.
(7) Parallel Pair, Steel A Galvanized	.083-135 Steel	16.8	478	While lower in cost than individually insulated wires, the carrier and dc resistance objections against 14-gauge copperweld apply with greater force to the use of this wire.

Note: Numbers (1), (2), etc. refer to corresponding items on *Table II* "DC Loop Resistance in Ohms and Estimated Attenuation in db per Mile."

Table III

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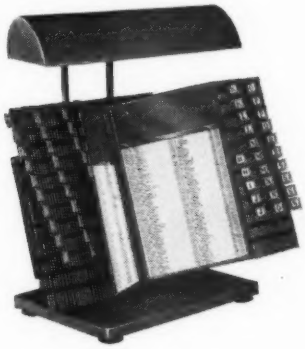
INSTANT REFERENCE with ACME VISIBLE FLEXOLINE



Year after year more businesses are buying ACME FLEXOLINE to save reference time on hundreds of different kinds of records.

Listings are typed on scored FLEXOLINE sheets, separated in strips and filed just where they belong. New strips are quickly inserted . . . obsolete strips removed . . . the list is always up to date.

FLEXOLINE record equipment provides for a few hundred, or hundreds of thousands of individual records. Let the Acme man show you how FLEXOLINE can serve you . . . or mail coupon for illustrated literature.

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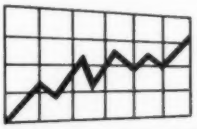
NAME	PHONE	ADDRESS	CITY	STATE
Fulcher, L S	TR 1 1456	608 Cabel	Washington	DC
Goebel, Arthur M	HA 4 6732	1674 Grand	Seattle	Wash

CREDIT AUTHORIZATION

ADDRESS	NAME	AUTHORIZED	LIMIT
1722 Naples St	Davis, W L	Mr & Miss	C-3
4465 Kenmore Ave	Eggers, Joseph	Mr	A-2



PRICE RECORD

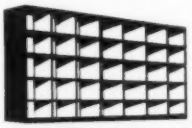
CAT NO	ITEM	UNIT	LIST	JBR	DLR	BRANCH
534-65	Tube, Glass ¼"	Ft	.35	.20	.30	.18
534-66	Tube, Glass ½"	Ft	.40	.25	.35	.23

BADGE NUMBERS

NO	NAME	DEPT	LCKR	FL	BLDG
1654	Simner, Berney	169	1456	3	18
1655	Barber, Wm M	113	1273	2	29

SENIORITY LISTINGS

NAME	DEPT	JOB CLASS	PLANT	DEPT
Williamson, George N	45	Mach Opr	11-11-45	12-16-48
Juergenson, Walter	45	Mach Hlpr	11-23-46	12-23-48



BIN LOCATIONS

PART NO	NAME	BLDG	AISLE	SECTION	BIN	PRICE
CX 138597	FUSE 2 Amp	1	F	12	1	1.15
CX 142303	BULB Lamp	2	A	8	3	1.50

SHIPPING

CONNECTICUT	
Branford	Wilson to Richmond c/o McLean
Centerbrook	Smith to Baltimore c/o Associated Transp

T4-6-57

ACME VISIBLE RECORDS, Inc., Crozet, Virginia

☐ We are interested in Acme Visible Equipment for _____ records.
KIND OF RECORD

☐ Have representative call. Date _____ Time _____

☐ Send us more information and literature on FLEXOLINE.

Company _____ Attention _____

Address _____

City _____ Zone _____ State _____

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

XUM

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

IN A RECENT letter, E. R. Kerwin, applications engineer for the General Electric Co., had the following to say about dancing cable:

"Your reply to the question on dancing lightweight plastic cable in February 16 TELEPHONY agrees with my findings on the subject. The problem has not been extensive and the reports generally emanate from areas where small-sized spun cables, 26 pair and under, are installed in exposed locations subject to variable high winds.

"Cable dancing field trials were conducted by the BTL in Lubbock, Tex., (Southwestern Bell Telephone Co.) on lightweight plastic-sheath cable and the conclusions drawn from my observations in March, 1957 on the various construction methods employed were as follows:

"1. Pulley-suspended concrete weights from the messenger strand at the midpoint on short spans and at the ⅓ and ⅔ points on long spans. These did not prove successful, and cases were reported where these weights were thrown off the strand when pole line was exposed to high wind loads.

"2. Guy wire attached to the pole and to the strand at the ⅓ and ⅔ points then onto the next pole through pulleys. This was not effective since the guy wire broke in a very short time and would pull through entire sections.

"3. A second strand mounted above the messenger to hold the spun cable assembly with the two strands strapped together at the ⅓ and ⅔ points. This seemed to help the situation but was considered too expensive.

"4. Special weights with torsion spring members were suspended on the strand at the ⅓ and ⅔ points. These gave good results; however, they were also considered too costly.

"5. A length of cable installed (but not working) without any messenger strand showed no sign of wind whipping. (Equivalent to present self-supporting type construction.) Another section installed with rings also showed no signs of whipping.

"6. Lead-sheath cable installed under identical conditions and in equivalent sizes did not show any signs of dancing.

"The corrective measures tried in Texas would be too costly to be practical.

"Further studies resulted in the development of the technique of twisting the cable and the strand one turn for each 25 feet to change the air flow characteristics of the assembly, thereby neutralizing the tendency for the wind to lift the cable and start the severe gyrations commonly referred to as dancing. This was covered in a report by N. Aamodt of the BTL at the AIEE Winter Meeting, Feb. 2, 1955.

"REA and Bell have issued field instructions on the twisting method recommended for cable installations where wind whipping is encountered."

•

We continue to hear about the all-dial telephone system being provided for the Waldorf-Astoria Hotel in New York City. They have now converted 200 rooms and 400 will be completed by June 1. The entire installation of 2,000 telephones will be converted by 1958.

The new telephones match the room color. Each is equipped with a light that goes on during a guest's absence to advise him that a telephone message is waiting. It is claimed that the Waldorf will be the first hotel in the world to offer all dial service for both local and long distance service.

Traffic on the 28-position hotel switchboard has become too heavy to be handled economically. When 2,000 to 3,000 guests surge in at one time for conventions, the manual board is heavily overloaded. Guests who have to wait for calls sizzle and fume. This will not happen with automatic operation as the flood of calls will by-pass the hotel switchboard.

It is stated that calls from the hotel now total more than 1½ million a year, almost double what they were a few years ago.

After the new system has been placed in service, the Waldorf expects to offer direct telephone dictation service from all rooms. Guests will be able to dial a certain number, dictate letters to a tape recorder and have finished letters back for signature within an hour.

•

We enjoyed a visit in Washington, D. C., recently with Kenneth S. Wyatt, engineer of cables for Phelps Dodge Copper Products Corp., of New York City.

Mr. Wyatt showed us numerous samples of aluminum-sheathed cable that had considerable flexibility and strength with a thin wall. This design is made possible by a new corrugation method which increases the flexibility of the cable and at the same time gives it greater strength with the use of thin aluminum.

This method of corrugation is known as the "OKD" and was developed by a firm in West Germany.

•

We thoroughly enjoyed reading the article "Exploration—Three Miles Down" by H. H. Bartlett, headquarters engineer for the AT&T company, which appeared in March 1957 *Long Lines*.

This article describes in an interesting manner a survey made with sonar depth recording instruments to map a route for laying the submarine telephone cables from San Francisco to Honolulu last summer.

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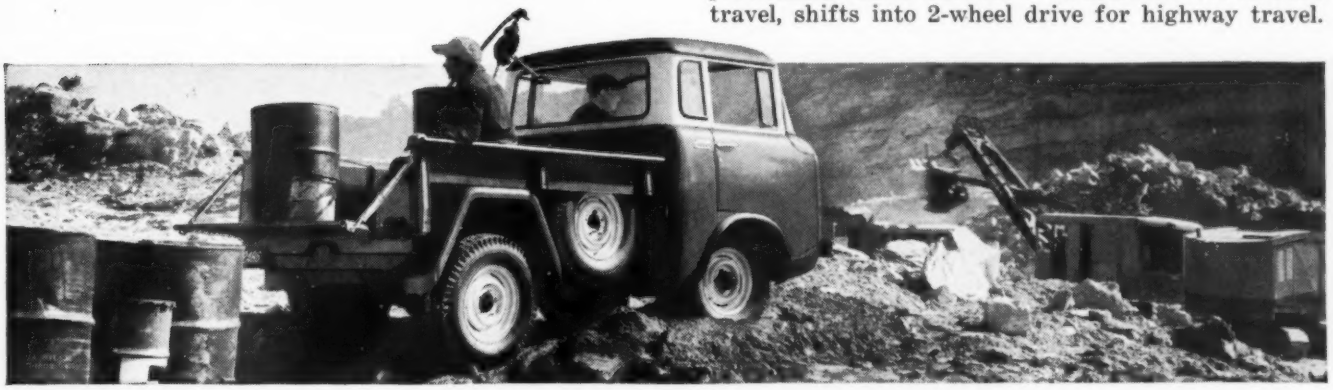
New capacity!

The completely new Forward Control 'Jeep' FC-150—the first time a 4-wheel-drive Truck has so effectively combined maximum cargo capacity with exceptional maneuverability! New Forward Control design puts a 74" pickup box on an 81" wheelbase. And the FC-150 retains famous 'Jeep' ruggedness and versatility.

New maneuverability!

It's the world's shortest turning 4-wheel-drive Truck! For safer off-road maneuverability, it gives you up to 200% greater forward visibility. Powered by the engine that made 'Jeep' vehicles famous, the new FC-150 provides the extra traction of 4-wheel drive for off-road travel, shifts into 2-wheel drive for highway travel.



New style!

The new look and feel of tomorrow! The FC-150's Safety-View Cab combines beauty with utility. Its new wrap-around windshield is the largest in the 5,000 GVW class. There's plenty of extra leg and head room. Here is new styling, comfort, convenience and safety all in today's most advanced 4-wheel-drive Truck.

New 'Jeep' *Forward Control* *4-Wheel-Drive* **FC-150**

...other members of the famous 'Jeep' family:

Universal 'Jeep'

'Jeep' Truck

'Jeep' Utility Wagon

Willys...world's largest makers of 4-Wheel-Drive vehicles

See 'Jeep' vehicles at your WILLYS dealer

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The outage that could have been shortened ... *with Dow Brush and Weed Killers*

The trouble call came in at 10:25. The crew reached the scene in seventeen minutes.

From that minute on, they found good reason why Dow brush and weed killers should have been there before them. The first stab of the truck spotlight showed a tangle of undergrowth

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that meant the wait for restored power had only started.

The same spring thunderstorms that had kept them hopping for weeks had jumped weeds waist-high and jungle-thick. Thriving brush and trees made the right of way no place for this repair crew in a hurry.

Their next trouble call can be different . . . thanks to Dow brush and weed killers. Esteron* 245, Kuron* and Esteron Brush Killer can clear the right of way of brush and trees. Radapon*, containing dalapon, controls grass all year long. Baron* levels many broad and narrow-leaf weeds with one treatment.

Wherever you're faced with unwanted vegetation, we can help you solve the problem the modern, chemical way. This sure, cost-saving control is waiting for you now . . . at Dow. Write THE DOW CHEMICAL COMPANY, Industrial Section, Agricultural Chemical Sales Dept., Midland, Mich.

Trademark of The Dow Chemical Company

YOU CAN DEPEND ON DOW

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THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

CHALFONTE-HADDON HALL, Atlantic City, N. J., has an interesting publication which comes to the writer's desk occasionally and its perusal stirs fond memories of a trip to Atlantic City many years ago when she was in her teens. There was the ride on the boardwalk, which fulfilled a long cherished dream, after reading a romantic story about a young lady who met her fiancé in such a manner. Dancing on the pier, salt water taffy, sun sessions on the beach, and bathing.

The Spring issue came the other day and it stated that at Chalfonte-Haddon Hall they manage to get along happily from one year's end to another with only three seasons—Spring, Summer and Autumn—without shedding a tear for the Absent Season which never appears on their hotel register. One royal guest is conspicuous by his absence at Chalfonte-Haddon Hall: King Winter.

The article which had the greatest appeal in the Spring issue was entitled, "Switchboard Odyssey." It was a story about a former switchboard operator at Chalfonte-Haddon Hall and I hope you will find it of interest, as I did:

"We have decided to set aside this space to scotch for all time the rumor that 'Annie Doesn't Live Here Anymore.' Annie—you may know her as 'Orphan Annie' or 'Myrt' or, if you are a former guest, as Anne Morrow—definitely *does* live here anymore. She has her own Chalfonte-Haddon Hall apartment where she lives with her husband; and she has a private line connected directly with the CHH switchboard so that she may still welcome familiar voices she has known over the years since 1921.

"Anne, almost as much a tradition among our guests as Chalfonte-Haddon Hall itself, became Chief Telephone Operator Emeritus last Jan. 5. She is not so much retired, however, that she can't chat with tradition-minded folk who regard a visit incomplete without a word with her.

"Born 70 years ago, the daughter of a Philadelphia physician, Dr. Charles E. Myers, Anne came to Chalfonte 35 years ago. Mother Leeds, who then presided over the back of the house while her son, Henry, one of the founders, greeted guests—employed Anne to take charge of the hotel's switchboard. When Haddon Hall was completed eight years later, with its much larger and complex switchboard, who could possibly have been selected to head it up? Anne, of course, who became chief *dea ex machina* as the two hotels combined their telephone service.

"Anne's feats at these switchboards have been notable. Comes to mind the night the Steeplechase Pier caught fire. It was Anne who called the alarm into City Hall. Nobody would believe that she was serious. She called the pier's owners. Again she was confronted with incredulity. Plugging away at her board she managed to din into the city officials and owners the fact that she was reporting a fire. Everyone arrived finally and saw, from the rubble that had been a pier, just how serious Anne had been about the whole thing.

"But all of Anne's efforts at preventing disaster were not doomed to failure. There was the time she saved a guest's life by insisting on investigating why his telephone was off the hook when no one was talking. The guest had been stricken by paralysis. Unable to speak he had pulled the telephone from its bedside table. Anne and the CHH physician did the rest. She was merely following her own rules, for she had always trained her operators to investigate any unexplained off-the-hook telephones.

"And speaking of training telephone operators. The story hereabouts is that if you call any hotel in Atlantic City, the chances are 50-50 that the girl who answers will be one who has been trained by 'Our Annie.'

"Anne, like the Mounties, has the deserved reputation of always getting her man. She has tracked parties by telephone across the country to find them in the wilderness, on deserts and on ocean liners. She made the first commercial shore-to-ship telephone call in 1929. Seems a New York advertising man named William M. Rankin, a guest at CHH, had an unquenchable desire to talk with Sir Thomas Lipton, noted English tea tycoon and yachtsman. Anne found him aboard the Leviathan, 200 miles at sea, and completed a five-minute connection at a cost of $35. Being a good, ethical operator, Anne doesn't know what the call was about.

"Anne consented to retire from active service at CHH only after the doctors had given her orders to quit and made it plain that they meant it. Every time someone asks us about her, we start talking, and one thing leads to another, and the first thing we know we are wondering where the day, or the night, has gone. There is no brief way of telling about Anne, or 'Myrt,' or 'Orphan Annie.'"

A wonderful and well merited tribute to a PBX operator who gave the best years of her life to a service she loved! Anne can be duplicated, over and over again, by the faithful operators throughout the nation, who give unstintingly of themselves and their service, which has resulted in placing them in a special category and establishing a tradition—"The Message Must Go Through!"

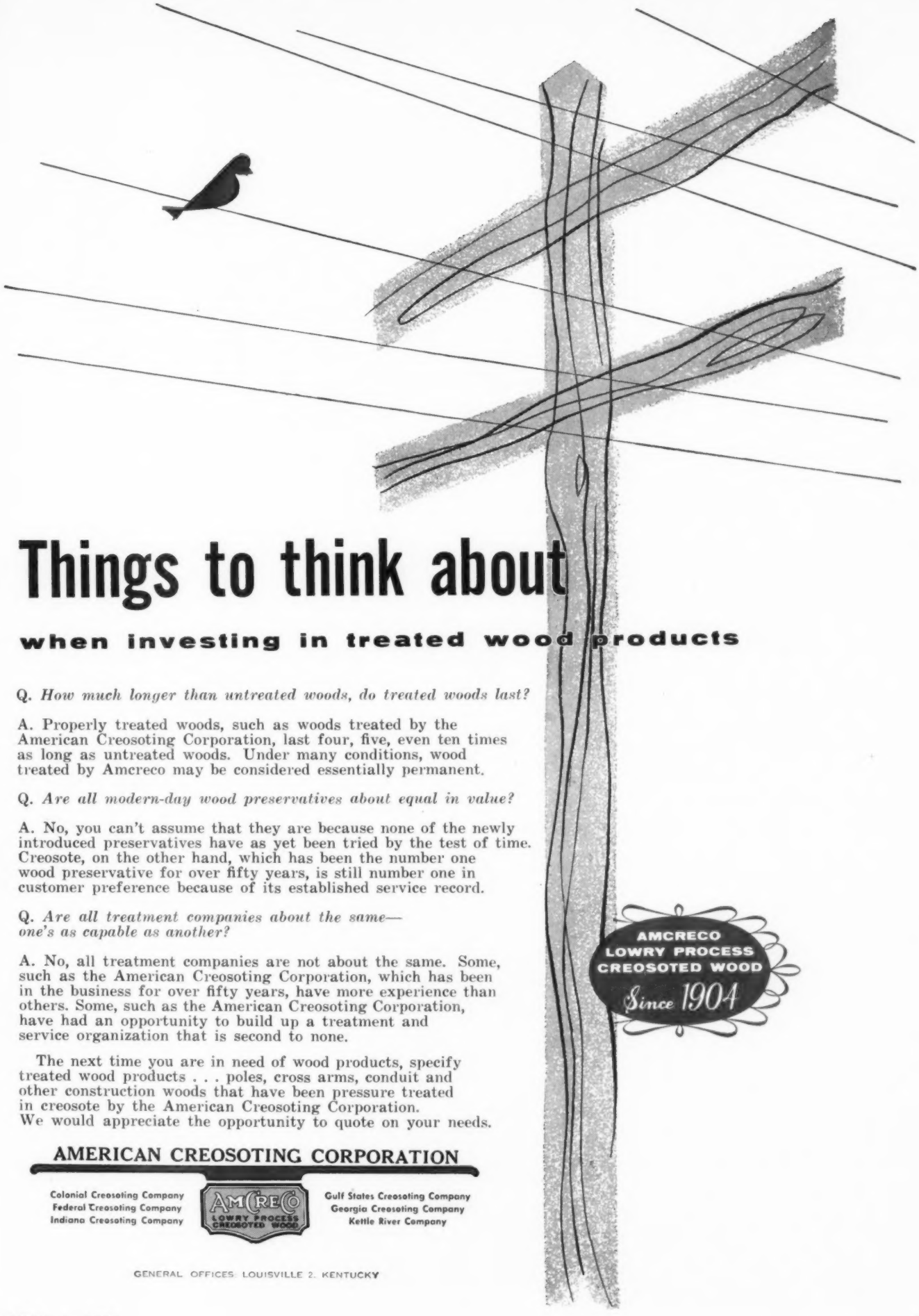
Traffic Questions

(1) When should an Information operator answer a new call?

(2) Should the Information operator have more than one call underway at a time?

(3) Should an Information operator

(Please turn to page 60)



Things to think about

when investing in treated wood products

Q. *How much longer than untreated woods, do treated woods last?*

A. Properly treated woods, such as woods treated by the American Creosoting Corporation, last four, five, even ten times as long as untreated woods. Under many conditions, wood treated by Amcreco may be considered essentially permanent.

Q. *Are all modern-day wood preservatives about equal in value?*

A. No, you can't assume that they are because none of the newly introduced preservatives have as yet been tried by the test of time. Creosote, on the other hand, which has been the number one wood preservative for over fifty years, is still number one in customer preference because of its established service record.

Q. *Are all treatment companies about the same—one's as capable as another?*

A. No, all treatment companies are not about the same. Some, such as the American Creosoting Corporation, which has been in the business for over fifty years, have more experience than others. Some, such as the American Creosoting Corporation, have had an opportunity to build up a treatment and service organization that is second to none.

The next time you are in need of wood products, specify treated wood products . . . poles, cross arms, conduit and other construction woods that have been pressure treated in creosote by the American Creosoting Corporation. We would appreciate the opportunity to quote on your needs.

AMCRECO
LOWRY PROCESS
CREOSOTED WOOD
Since 1904

AMERICAN CREOSOTING CORPORATION

Colonial Creosoting Company
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Indiana Creosoting Company

AMCRECO
LOWRY PROCESS
CREOSOTED WOOD

Gulf States Creosoting Company
Georgia Creosoting Company
Kettle River Company

GENERAL OFFICES LOUISVILLE 2, KENTUCKY

Maintenance Testing Equipment

By JOHN A. BRACKEN

PART 78. The preceding article in this series appeared in the March 10, 1956 issue, page 32.

COMMON INDICATIONS of faults capable of seriously affecting the operation of a transmitter are as follows:

(1) Not enough carbon granules in the carbon chamber. As a result the transmitter is less sensitive to sounds striking the transmitter diaphragm.

(2) Transmitter packed. By packed is meant that the carbon granules in the transmitter carbon chamber stick together and form a solid mass. This is the equivalent of a short circuit. The granules may pack almost instantly in some cases, or they may pack slowly under conditions of regular service.

In general, packing may be caused by: (a) Poor grade of carbon granules. (b) Granules not uniform, the undersize granules gradually settling in between the larger ones and wedging into a solid mass. (c) Carbon chamber too full. (d) Moisture in the carbon chamber. In the case of capsule type transmitter units, the probability of moisture entering the carbon chamber is practically eliminated, due to the unit being sealed.

(3) Excessive noise. According to the principle that the operation of a transmitter depends upon variations in the resistance of the carbon granules, causing changes in the value of the current passing through the transmitter, it would seem to follow that the greater the current, the better the transmission.

This is not the case, because if the current is allowed to increase sufficiently to cause arcing between the carbon granules, they will burn, thereby causing the transmitter to become noisy. This is usually manifested in the telephone receiver by a scratching or frying sound. Lightly tapping the transmitter with the finger will cause an abrupt change in the sound.

(4) Handset held incorrectly as shown in *Fig. 1*. With the handset in this position, the speaker is not clearly understood because he is not talking directly into the transmitter mouthpiece. Therefore, the relation between good transmission and the manner in which the handset is held in regard to the transmitter and the speaker's mouth is very important. In this respect, the best results are usually obtained when the handset is held in such a manner that the transmitter mouthpiece is placed directly in front of the speaker's mouth at a distance of about ½ inch from the lips, as shown in *Fig. 2*.

Fig. 1

(5) High resistance. The normal resistance of a transmitter varies between wide limits, depending upon make, type and amount of current flowing through it. However, when the resistance of a transmitter becomes greater than the manufacturer's rating, it is considered to be high.

Fig. 2

If the resistance becomes greater than the manufacturer's rating, the talking current passing through the transmitter will be less effective than normally required, because a greater amount of the operating EMF must be expended in forcing the current through the transmitter high resistance.

(6) A short circuit. When this occurs, it is evidenced by a customer's report of "can't be heard."

(7) An "open." The term "open" is commonly used when considering whether a transmitter's conducting path is broken. This situation is usually indicated by a customer's report of: (1) Magneto area—"can't be heard." (2) Manual area—"dead" or "can't call operator." (3) Dial area—"dead" or "no dial tone."

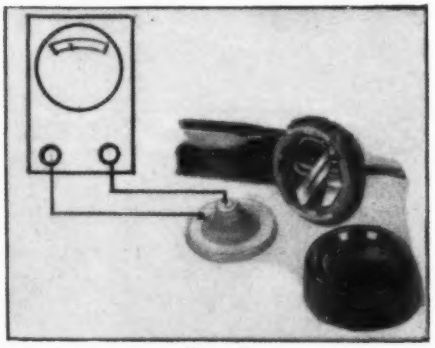

Fig. 3

An open or a short-circuited transmitter may be detected by unscrewing the transmitter mouthpiece, removing the transmitter unit from its case and testing it for continuity. Any test enabling a check to be made to determine whether an electrical conducting path is continuous between two points, is called a continuity test.

This is, in effect, a resistance measurement, but where the primary concern is to simply verify whether an open or a short circuit exists, a continuity test affords a quick means for detecting an abnormal circuit condition without bothering to determine the actual resistance.

(Please turn to page 62)

Early Teletypewriter

Teletype Model 28 Printer

50 years that changed the picture

The need for a reliable printing telegraph instrument that would provide a typed record of the message for both sender and receiver brought the company now known as the Teletype Corporation into the picture in 1907. From the halting performance of the original page printer to the smooth 100 words per minute of today's precision equipment has been a major step in communications.

But today Teletype equipment is often far more than a communication instrument. It is a basic element in production control systems . . . its ability to transmit and reproduce text and punched tape is harnessed to office automation . . . it provides a "conveyor system" for channeling complex raw data to a computing center thousands of miles away – and getting the answers back in a twinkling.

Indeed, Teletype machines have made many of the dreams of 1907 a daily part of today's business world. And the horizons widen daily as new dreams occupy our engineers and keep our laboratories humming.

If you would like a copy of our booklet, "The ABC's of Teletype Equipment," write to Teletype Corporation, Dept. T4, 4100 Fullerton Ave., Chicago 39, Illinois.

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1957 Golden Anniversary Year

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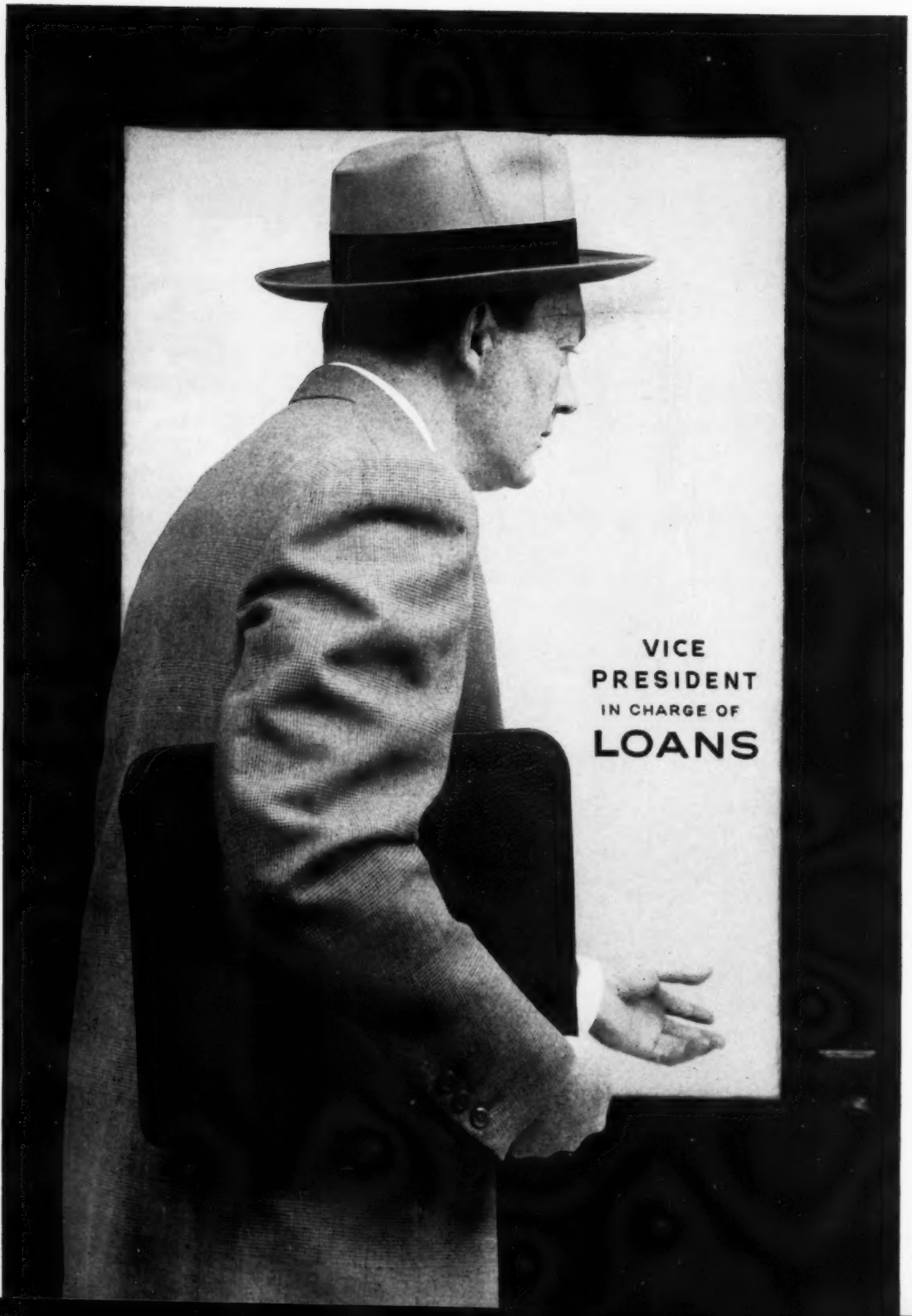
WHAT HAPPENS WHEN



N YOU GO

THROUGH THIS DOOR?

THE day you ask for money to buy dial equipment is an important one for your company... but what about the man behind the door—the man who can say "yes" or "no" to your plans?

The man you want to borrow from will base his decision on many factors: The quality of your management, your earning potential, your telephone experience, your subscriber relations, your operating ability, *and the reputation of the dial switching equipment you plan to buy.*

If you're planning to buy Strowger Automatic, you can approach any lending agency with the positive assurance that you have chosen the most well-known, dependable, and proved-in-service switching equipment available.

Consider this. It can mean much to you. And if we can help you in any way, please let us know.

Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

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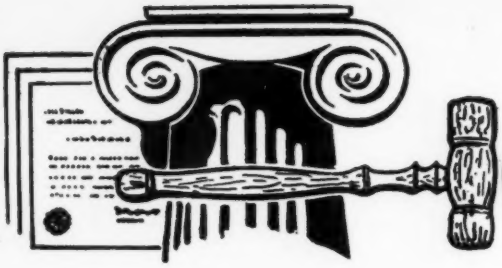

Courts and Commissions

Florida Company New Rates To Produce 4.53% Return

An increase in revenues of $21,060.92 to afford the Gulf Telephone Co., Perry, a 4.53 per cent return, was authorized to the Florida Railroad & Warehouse Commission on Mar. 20.

In 1956 the Gulf company's total operating revenues were $85,772.72, and with the new rates this figure will approach $106,833.64. The company last year operated at a $3,696.90 loss; now it will realize net income of $9,617.02. The commission fixed the rate base at $212,203.70.

Following are the approved rates:

One-party business	$8.00
Two-party business	6.50
Four-party business	5.25
One-party residence	5.00
Two-party residence	4.00
Four-party residence	3.25
Rural multi-party:	
Business	4.00
Residence	3.00
Each additional 2 miles	.25
Urban service, extended beyond base rate area, an additional charge per ¼ mile of line:	
One-party	.42
Two-party	.21
Four-party	.11

The Gulf company serves upwards of 1,450 common battery stations.

Minnesota Independent's Rate Request Approved

The Crow Wing Cooperative Rural Telephone Co.'s application for higher rates for its Randall exchange received approval on Mar. 28 from the Minnesota Railroad & Warehouse Commission.

The company plans to convert Randall to automatic operation in November, and sought both an interim schedule for manual operation and dial service rates. Of the company's approximately 309 local and 615 rural stations, 93 local and 111 rural stations are served from the Randall exchange.

After conversion of Randall to automatic, and provision of extended area service to the Little Falls exchange of Northwestern Bell Telephone Co., it is estimated that this exchange will be serving approximately 138 local and 220 rural stations.

Operating revenues at Randall under the approved manual rates will rise from $5,642 to $8,743, and a deficit of $2,054 will be replaced by net income of $992, a 5.29 per cent return on the plant's original cost of $17,400.

Approved manual and dial service rates are as follows:

	Manual	*Dial*
Business:		
One-party	$4.50	$8.25
Two-party	4.00	7.25
Rural multi-party, metallic	3.25	6.25
Rural multi-party, grounded	2.75	——
Residence:		
One-party	3.25	4.50
Two-party	——	4.00
Four-party	2.50	3.50
Rural multi-party, metallic	2.75	4.50
Rural multi-party, grounded	2 25	——
Mileage charge for service beyond the local base rate area, each ⅛ mile or fraction thereof:		
One-party	.40	.40
Two-party, each subscriber	.20	.20
Four-party, each subscriber	.15	.15

Lincoln T&T Registers 68,750 Shares of Common

The Lincoln (Neb.) Telephone & Telegraph Co. has registered a 68,750-common-share subscription offering with the Securities & Exchange Commission, it was reported on Mar. 29.

Holders of record April 10 will get rights until May 1 to subscribe on the basis of one new share for each three shares held. Dean Witter & Co. and associates will underwrite 53,114 shares of the offering.

Proceeds will be used to reduce short-term bank loans incurred to finance construction.

Wis. Independent Asks Raise

The Wisconsin Public Service Commission on April 3 was to hear the application of the Vernon Telephone Cooperative for authority to establish rates for dial service and for acquisition of membership fees and equity capital from patrons.

Virginia Company Applies For Rate Increase

The Roanoke & Botetourt Telephone Co., Daleville, has asked the Virginia Corporation Commission for permission to raise telephone rates, it was reported on Mar. 14.

The commission set April 22 as the date for a hearing.

In its application the company asked the commission to approve a new schedule for the Eagle Rock and Fincastle exchanges effective May 1, and higher rates at the Troutville exchange, effective May 19.

If approved, one-party business rates would go up 50 cents to $14 50 in the Troutville area. In Eagle Rock and Fincastle, the proposed increase would be $2.50, bringing one-party business service to $7.50.

Ala. Company Gets OK to Raise, Borrow, Consolidate

The Alabama Public Service Commission on Mar. 7 granted the Rockford Telephone Co. authority to increase its telephone rates, borrow $10,000 and expand its facilities to link with those of Southern Bell Telephone & Telegraph Co.

The company, headed by J. F. Carpenter, estimated in a petition that installation of an automatic system plus expansion of facilities would require an expenditure of approximately $16,550. The loan was needed, the company said, to help with this project.

Basic rate increases will include a raise from $5.00 to $6.75 for one-party business service.

Southern Bell Asks to Buy North Carolina Independent

Southern Bell Telephone & Telegraph Co. asked the North Carolina Utilities Commission on Mar. 29 for permission to purchase the Pender Telephone Co., Burgaw, from Mrs. J. B. Waddell.

In applying for a certificate of public convenience and necessity, it said that it plans to expand and improve service in the area.

(Please turn to page 41)

IT'S IRRADIATED!

SUPERIOR TELEPHONE CABLE

Superior Cable contains a tape, marked at one-foot intervals up to 10,000 feet, that guarantees the footage you receive and lets you measure the footage you use.

Contains a polyethylene tape developed by radiation chemistry!*

Install SUPERIOR Telephone Cable for better round-the-clock performance with minimum maintenance.

All-plastic SUPERIOR Cable is irradiated* . . . has double the dielectric strength for far greater lightning protection! Its resistance to moisture, ozone, oils, acids and alkalis makes it ideal for either aerial or direct burial installations! The insulation is "graded" to conductor sizes . . . to closely match the universal transmission standards for loading coils and terminating equipment! The deviation in mutual capacitance is now less than 1½%!

For better round-the-clock performance at less cost, order SUPERIOR CABLE. Available with regular spiral shield (5 mil aluminum) or, in certain sizes at slight additional cost, longitudinal shield (8 mil aluminum).

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Jolly Joe's not so lighthearted nowadays

You see, he went dial in a bit of a haze.

Came Direct Distance Dialing, Joe really "burned"

For changes were far too costly, he learned.

Just when he'd thought he was over the hump

He had to consign his exchange to the dump

MORAL: BUY STROWGER AUTOMATIC—it's ready for anything!

Poor Joe! If he'd only bought Strowger, his investment would have been safe. Strowger Automatic meets every requirement of Direct Distance Dialing, easily and economically. Investigate Strowger now . . . call in your friendly Automatic representative. He'll be happy to help you plan a prosperous, secure future.
Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7.*
Or call HAymarket 1-4300.

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

Pender Telephone was operated by Mrs. Waddell's husband from 1933 until his death about three years ago, and serves approximately 570 subscribers in Burgaw and the surrounding territory.

Neb. Supreme Court Rules On Sales by Telephone

A merchant who uses the telephone to close sales does not come under the legal definition of an itinerant merchant where the Nebraska Itinerant Merchant Act is concerned, the Nebraska supreme court has ruled, it was reported on Mar. 18.

The court reversed and remanded with directions to dismiss a Cuming County district court conviction of a South Dakota merchant on charges of violating the state act.

Testimony given before the supreme court showed the merchant had made sales in Nebraska by telephone before delivering his merchandise. It was also shown that he had an established place of business within the 250-mile limit specified by the Nebraska Act.

Cal. Company Authorized to Sell $5,000,000 in Bonds

California Water & Telephone Co. was authorized by the California Public Utilities Commission to sell to six insurance companies 5 million dollars, principal amount of 5¼ per cent debentures, due April 1, 1982, it was reported on Mar. 25.

The company said it plans to put the proceeds from the sale into its construction program.

Illinois Bell Authorized Mobile Service Increase

Rate increases of $195,000 a year for Illinois Bell Telephone Co.'s mobile radio-telephone services were authorized on Mar. 22 by the Illinois Commerce Commission (TELEPHONY, Mar. 2, p. 34).

The commission said the increases would give the company a 4 per cent return on the mobile service.

Ohio Bell Buys Interest

The Ohio Public Utilities Commission recently authorized The Ohio Bell Telephone Co. to purchase 6,166 additional shares of the common stock of the Mansfield Telephone Co. at the rate of $27.60 per share, along with the 23,434 shares of this stock now held by the Bell company (TELEPHONY, Mar. 23, p. 46).

OK Bond Sale in Oregon

The Oregon Public Utility Commissioner, Howard Morgan, on Mar. 27 authorized West Coast Telephone Co., Everett, Wash., to sell at private sale 3 million dollars of bonds, 5⅜ per cent Series due 1982, at 100 per cent of face amount to a group of insurance companies. The money will be used to reimburse the company's treasury for construction and improvements, also to repay short-term bank loans.

Texas, Oklahoma Companies Merge with General of SW

Walter G. Wright, president of the General Telephone Co. of the Southwest, with home offices in San Angelo, Tex., has announced that the Texas Telephone Co., with home offices in Sherman, Tex., and the Oklahoma Telephone Co., with home offices in Broken Arrow, Okla., officially merged with the General Telephone Co. of the Southwest, effective April 1.

The Texas and Oklahoma companies were acquired by the General Telephone System when it merged with the Gary Telephone System in October 1955, and have been operating under the General System since then. Mr. Wright added that as a result of this merger, the number of exchanges served by the company will be 264; the number of telephones will be increased to 243,000 from 198,000; assets will increase to 72 million dollars from 56 million dollars; and the number of employes will increase to 3,500 from 2,900.

The General Telephone Co. of the Southwest sold to institutional investors 9 million dollars of 4¾ per cent first mortgage bonds and to the General Telephone Corp. 2.85 million dollars in common stock. The company traded 3.65 million dollars of its common stock for a like amount of Texas Telephone and Oklahoma Telephone common stock held by General Telephone Corp. Texas Telephone bonds totaling 2.51 million dollars were exchanged for General Telephone Co. of the Southwest bonds. Debentures and preferred stock of Texas Telephone, and bonds of Oklahoma Telephone were called for redemption.

Mr. Wright stated the merger will result in a better integrated and more efficient telephone operating system.

The General Telephone Co. of the Southwest operates in a five-state area, Texas, New Mexico, Oklahoma, Arkansas, and Louisiana.

Prosperity Inherent

". . . it has been demonstrated conclusively that the prosperity of our nation is not dependent on war or a peak level of defense expenditures."—HARLOW H. CURTICE, *president, General Motors Corp.*

Montana Governor Signs Highway Relocation Bill

Governor Aronson signed into Montana law on Mar. 19 a bill authorizing inclusion of 75 per cent of utility relocation along rights-of-way in the cost of highway construction. The utilities will be required by the measure to pay the remaining 25 per cent of the relocation costs.

The governor said the bill "may add some to the cost of highway construction, but it will also add to the amount of federal funds available to the state of Montana."

"A court test may also be necessary to test this new law," Governor Aronson said. "However, it is certainly in the best interests of an adequate highway system for all Montanans to promote the movement of utilities off the public right-of-way and onto the private right-of-way."

REA Telephone Advisors OK Altered Loan Requirements

Proposed changes in requirements for rural telephone loans were endorsed by the Rural Electrification Administration's telephone advisory committee meeting in Washington Mar. 25 and 26 (see *In the Nation's Capital*, this issue). The committee currently is composed of 17 representatives of independent commercial and cooperative telephone systems and the Bell System.

In their report to Administrator David A. Hamil the advisory group said that proposed changes probably "will expedite the extension of telephone service in rural areas while strengthening loan security for the government."

The proposed policy would require the establishment of a 10 per cent net worth floor for all borrowers, impose certain restrictions on the payments of dividends, and establish constructive managerial controls on both commercial and non-profit systems when the minimum net worth requirements were not met.

Cooperative or mutual companies would be required to collect membership fees of at least $10 from all new subscribers rather than to provide cash equity of from $25 to $50, as at present, and cooperatives would have to provide assurance that at least 70 per cent of the projected subscriber total was signed up and paid.

The committee again by majority vote asked REA to re-examine its requirement that competitive bids be obtained on central office equipment. Proponents of this change urged that this be made optional.

A subcommittee appointed last Octo-

XUM

ber to study costs of engineering requested REA to advise applicants for loans to assign their own personnel, where practical, to work under supervision of the consulting engineer. The advisory group concurred. Its report emphasized that loan applicants and borrowers can economize by more careful scheduling of engineering and construction work.

Importance of the attendance of REA Washington personnel at meetings of telephone associations and borrowers' groups was called to the attention of the administrator, who was asked to reconsider recent limitations on such attendance. At the same time the group recognized the need of better scheduling of meetings at which REA personnel might be of service.

John Van Ness Named Head Of Indiana Commission

Appointment of John W. Van Ness, Valparaiso businessman, as chairman of the Indiana Public Service Commission was announced by Gov. Harold W. Handley on Mar. 14. Mr. Van Ness assumed his new post on Mar. 18.

Van Ness, a Republican, was a member of the Indiana State Senate since 1939. He has served as president pro tem of the senate since 1944. Recently he had announced that he would not seek re-election to his office. He succeeds Warren Buchanan, Rockville attorney.

In addition to Mr. Van Ness, the other commissioners are: Ira Haymaker, Franklin attorney, Democratic member, and G. G. Skelton, Indianapolis accountant, Republican. George L. Diven, Indianapolis, is public counselor, and Edward W. Schurman, Indianapolis, is chief accountant.

Cal. Party Line Bill Would Impose Jail or $500 Fine

California's Assembly passed on Mar. 21 and sent to the state senate a bill to make it unlawful to refuse to yield a party telephone line in the event of an emergency.

Under the measure, listed as AB 709 by Biddick, the maximum penalty for failing to give up a party telephone line in case of a fire, police or other emergency call would be six months in jail or a $500 fine, or both. A similar penalty would be provided for falsely claiming an emergency in an effort to get a telephone line.

Help for Crippled

Crippled children learn to walk, to talk, to be useful and happy through services of the Easter Seal Society. You can help them by giving to Easter Seals.

IN THE NATION'S CAPITAL

Concluded from page 19

order specifically excluded such direct connection between the mobile telephone subscriber and regular telephone exchange service, and the California tariffs expressly provide for such exclusion.

Developments in Congress

Possible consideration of a boost in REA interest rates moved a step nearer in Congress when the House of Representatives, on Mar. 27, defeated by a vote of 225 to 174 a resolution by Rep. Wright Patman (D., Tex.) to have a general investigation of the fiscal policies of the Eisenhower administration.

If the resolution had prevailed, any suggestion about boosting interest rates on REA loans, such as the bill by Representative Hiestand (R., Cal.) would have been automatically held in abeyance.

That is because the Patman resolution was aimed at the so-called "tight money" policies of the Eisenhower administration. It was the contention of those in favor of more extensive federal spending and lending (regardless of budgetary consequences), that our "tight money" policy is a brake on our national economy.

For that reason special interest groups, such as the national association for the REA co-ops, want the "tight money" controls ended. If that were done, interest rates in general would slide back, and the REA interest rate of 2 per cent would not stick out like a sore thumb.

But the administration advisors feel that the "tight money" policy is a wise and necessary control to check inflation. They agree that it is a brake on federal lending and spending, as well as private lending and spending. They say that is what it was intended to be.

One of the things that did not help the Patman resolution was the author, Representative Patman, who has a reputation for partiality to easy money and unorthodox fiscal theories. When some of the Republican congressmen came right out and said so, Speaker of the House Sam Rayburn made one of his rare pleas on behalf of his fellow Texan. He deplored what he called a lack of confidence in Representative Patman, and what he was trying to do with his resolution.

But, evidently quite a few Democrats felt the same way about the Patman resolution as virtually all the Republican members. Hence, the decisive defeat of the resolution which now sets the stage for a further drive for more conservative fiscal reforms, including the REA interest question.

Speaking of fiscal reforms, both branches of Congress followed the line indicated in this department with reference to the continuation of corporation taxes at the present level of 52 per cent of taxable income. The Fulbright amendment, which would have lowered small business income taxes by boosting the rate on large corporation income taxes, was decisively defeated in the Senate by a vote of 52 to 33.

It is interesting to note that the Fulbright amendment, which originally boasted of support from 32 senators, was only able to muster one additional vote on the final showdown.

Sometimes the introduction of a bill in Congress with a lot of congressmen's names on it as co-sponsors is actually a confession of weakness. It indicates that the sponsors are trying to blast a way for their bill by massing all available support for it at the very outset. But, as they say at the racetrack, the payoff is on the result —not on the fancy work at the getaway.

Bohn Retires from USITA; L. H. Meyer His Successor

Frank E. Bohn, of Fort Wayne, Ind., recently resigned from the board of directors of the United States Independent Telephone Association, having served for nearly 24 years.

Mr. Bohn, who recently completed 50 years of service to the Independent telephone industry, also has resigned as chairman of the board of Home Telephone & Telegraph Co., now part of the General Telephone Co. of Indiana.

L. H. Meyer, president of General of Indiana, was appointed to fill the USITA board vacancy.

Governmental Economy

"The second Hoover Commission has performed a notable public service by pinpointing definite ways and means of achieving the twin objectives of governmental economy and the strengthening of free enterprise. In so doing, it has provided a rallying point for those who for more than two decades have watched with grave misgivings the encroachments of political authority on the economic lives and liberties of the people."—*Excerpts from "The Guaranty Survey," published by Guaranty Trust Co. of New York.*

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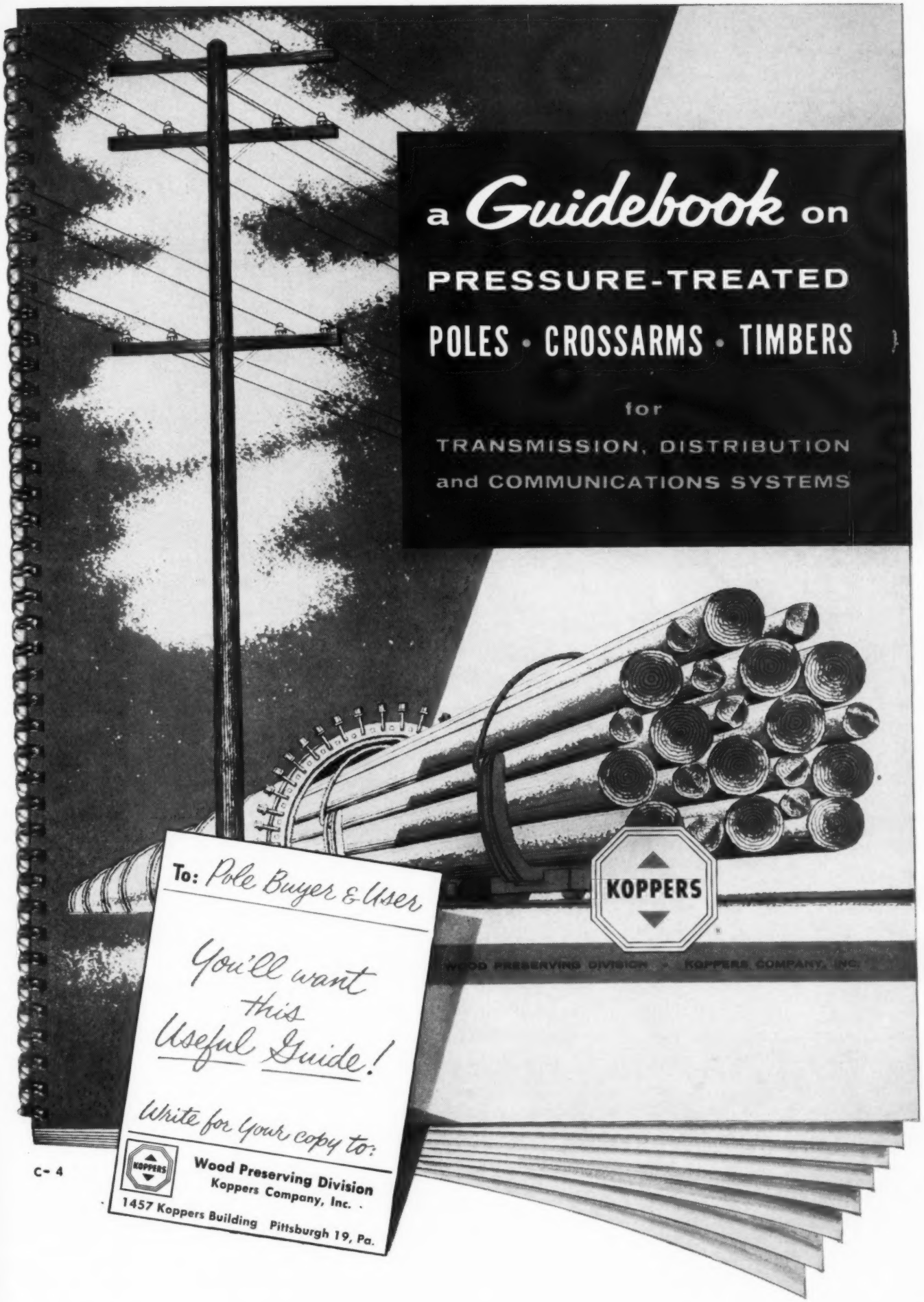
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Oklahoma Evolves Plan for Emergency Alarm System

The terrifying experience of a Payne County, Okla., farm woman has spurred a plan to eliminate the guesswork in summoning emergency aid to rural areas, it was reported on Mar. 19.

The plan took shape in the middle of the night after Mrs. Jerome Sykora had called the Stillwater Fire Department, asking for its resuscitator for her young daughter, who had a severe attack of asthma.

Mrs. Sykora, frightened and upset, couldn't remember exactly what she had said on the telephone. She kept thinking: What if she hadn't given the right directions to her home?

The fire department arrived in time —but those agonizing minutes of uncertainty gave Mrs. Sykora an idea— why not a rural alarm system that would avoid possible tragic delays from mistakes in directions.

From her idea the first rural emergency reporting system in Oklahoma is evolving. It calls for each rural dwelling in Payne County to be assigned a number. Fire departments at Perkins, Cushing and Stillwater will have a card file system, listing the number of each farm and out-of-town home, its exact location, the quickest route there and available sources of water for fire fighting. The card also will list the number and types of buildings at each location.

With Mrs. Sykora as project chairman, the 450 women of the county's farm wives' clubs have painted some 1,200 sign boards on which firemen are lettering the numbers. An estimated 1,600 farms and suburban homes will be covered by the system.

Bell Labs Names Doherty Assistant to President

William H. Doherty has been named assistant to president of Bell Telephone Laboratories, effective April 1, according to an announcement by Dr. M. J. Kelly, president.

Mr. Doherty has been assistant vice president, merchandising, of the American Telephone & Telegraph Co. since August 1955. Before that he was director of research in electrical communications at the Bell laboratories, where he began his telephone career in 1929.

A native of Cambridge, Mass., Mr. Doherty received the B. S. degree in electric communication engineering from Harvard University in 1927, and the M. S. degree in engineering the following year, also from Harvard.

His early work at Bell laboratories was in high-power transmitter development for transoceanic telephone service and broadcasting. This work led to the invention of a high-efficiency power amplifier now extensively used in broadcasting, for which the Institute of Radio Engineers awarded him the Morris Liebmann Memorial Prize in 1937.

W. H. DOHERTY

Later he participated in pioneering work in the fire-control radar field, and throughout World War II supervised a development group which was responsible for the design of a number of radars widely used on naval surface ships and submarines for gunfire and torpedo control.

He continued in military electronics work until 1949, when he became director of electronic and television research. He was appointed director of research in electrical communications in 1951 and continued in that post until he went to the AT&T company in 1955.

Mr. Doherty is a Fellow of the Institute of Radio Engineers and a former member of its board of directors. He holds an honorary Doctor of Science degree from the Catholic University of America.

General of Michigan Names Boveri to Executive Post

Charles E. Boveri, formerly assistant controller, General Telephone Co. of Michigan, has been elected secretary-treasurer of the company.

In addition to this move, the board of directors accepted the resignation of Robert J. White, former secretary-treasurer who has accepted the position of director of industrial relations with General Telephone Co. of the Southeast.

T. A. Saunders, company president, indicated that Mr. Boveri's election to the financial post was effective Mar. 22.

Mr. Boveri entered the telephone field following a two year tour of duty in the U. S. Navy. He is a graduate of Purdue University, holding the Bachelor of Science Degree in Business Administration.

With General Telephone Co. of Indiana, Mr. Boveri served as traveling auditor in the Lafayette headquarters, subsequently being elevated to general

C. E. BOVERI

plant accountant in 1951 and supervisor of methods and special studies in 1954. The new secretary-treasurer joined the Michigan company in May of 1955.

Mr. Boveri is active in the National Association of Cost Accountants.

A. J. Sordoni Laid Up With Broken Ankle

Andrew J. Sordoni, a director of the United States Independent Telephone Association and chairman of the board of Commonwealth Telephone Co., Dallas, Pa., on Mar. 29 was reported recovering from a broken ankle suffered in a fall on the steps of his Miami, Fla. home.

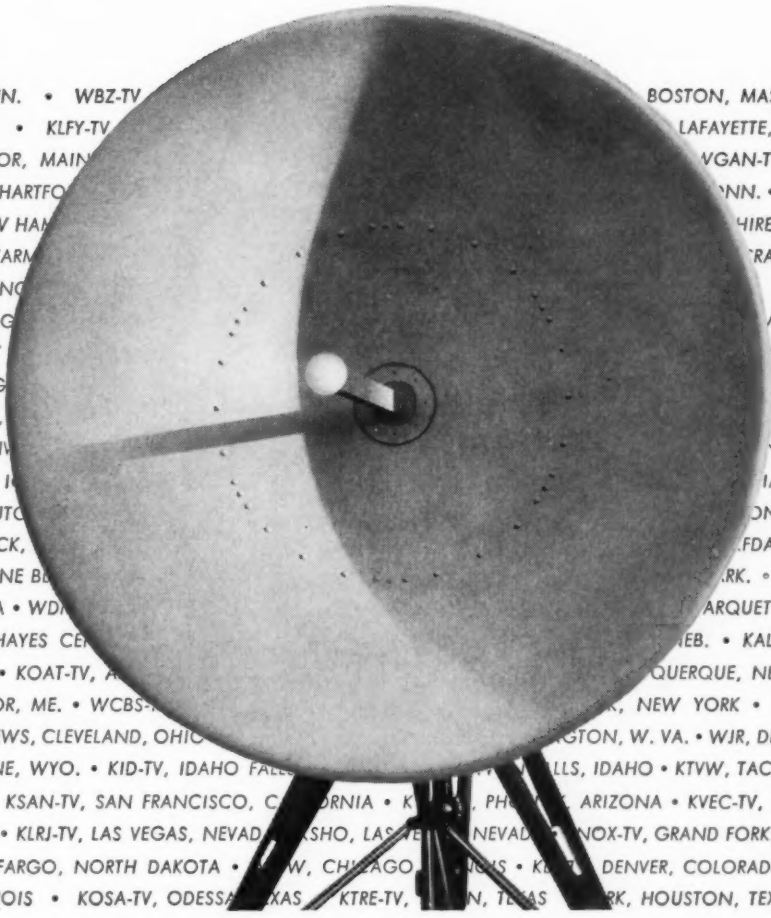
Mr. Sordoni is a former Pennsylvania state senator, and in addition to his telephone duties, he operates a contracting business, hotels, farms and other enterprises, and is active in educational and charitable organizations.

Western Light & Telephone Plans 1957 Financing

Western Light & Telephone Co., Kansas City, Mo., arranged a revolving credit agreement providing for temporary bank loans up to $1,700,000 during 1957, it was reported on Mar. 14.

E. P. Hennek, president, also reported the company plans to sell 2 million dollars in bonds later this year.

WHO'S USING IT?



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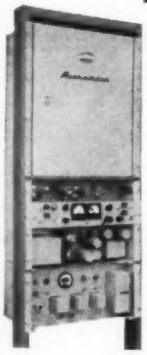

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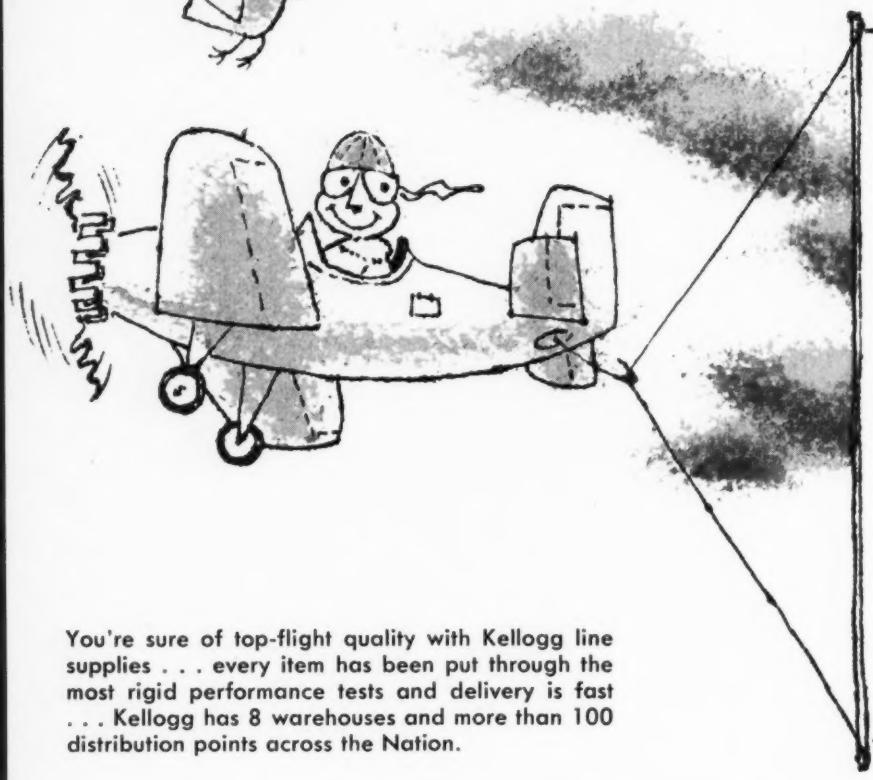

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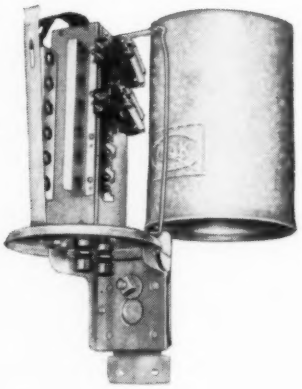

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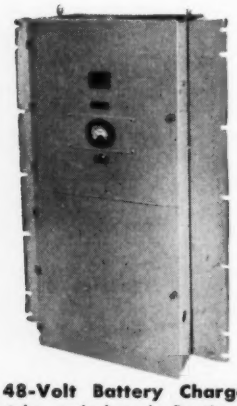

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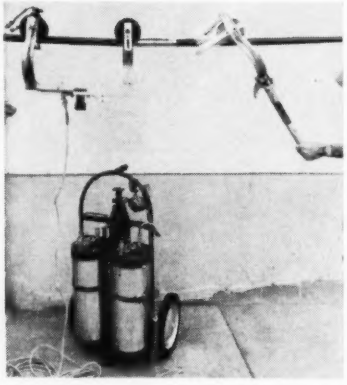
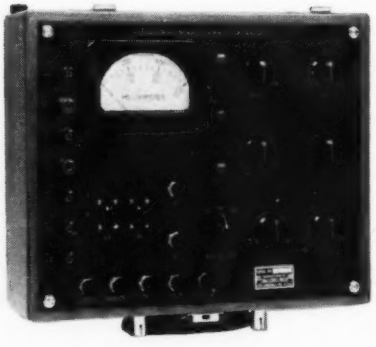


Cable Leak Detector—Two models are illustrated. Model at left is for high cables. Nozzles spray cable, air pressure from tanks causes air bubbles clearly seen from ground. S & G MANUFACTURING CORPORATION.



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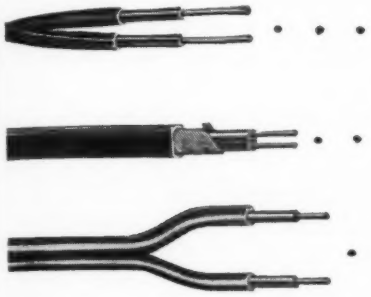

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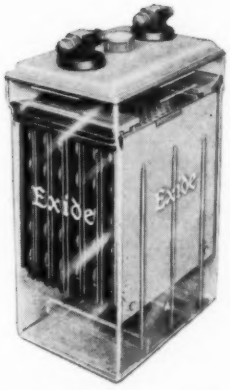

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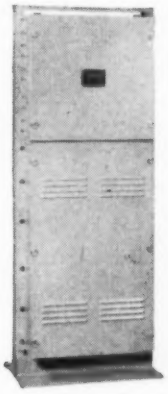
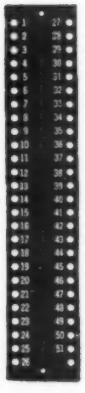
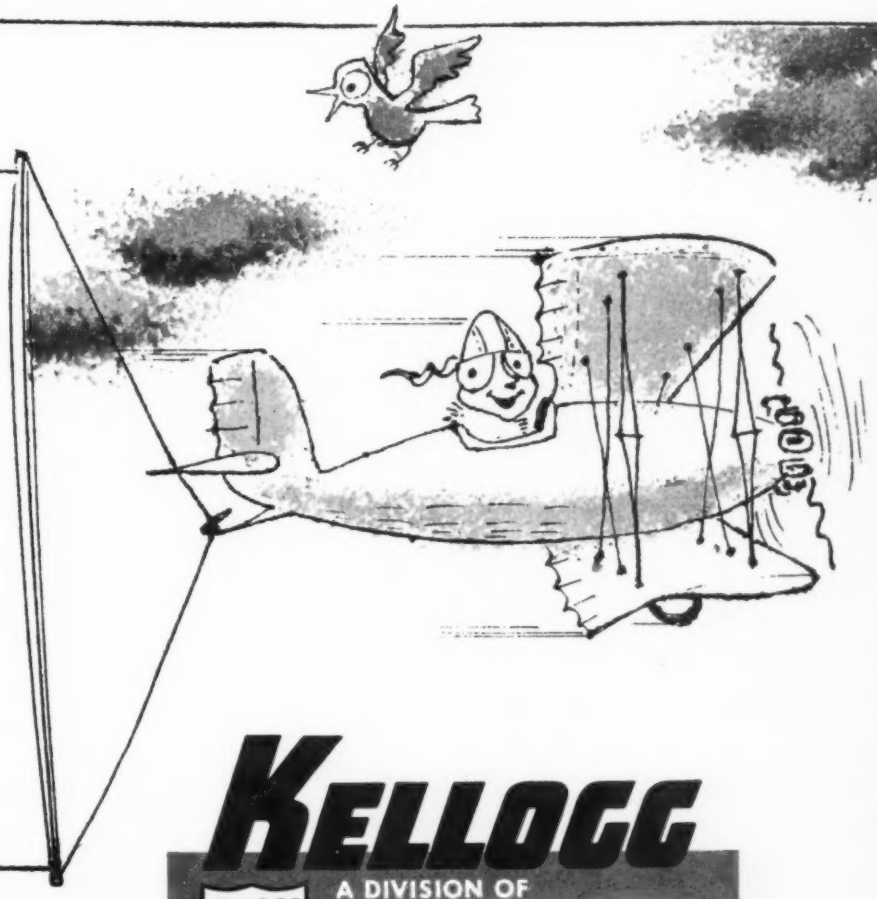


H-5 Subcycle for Harmonic Ringing Frequencies. Produces all frequencies in harmonic series, 16⅔, 25, 33⅓, 50 and 66⅔ cycles. Ringing frequencies locked to AC line frequency. Maintenance-free operation. A product of LORAIN PRODUCTS CORPORATION.



Splicers Fibre Test Boards, excellent quality. Used for classifying pairs when testing out cable. Numbers are easy to read and will not wash off. Made by J. FRANK MOTSON COMPANY.



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The Quickest and Easiest Way For All Above-The-Ground and On-The-Ground Clearing
Made Rugged — for Rugged Work and long, trouble-free service. Blades are high quality alloy steel forgings that stay sharp longer. Small compact heads for narrow crotches. Fewer working parts. There's over 75 years of cutting "know-how" built into every Porter Pruner.
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TYPE RP POLE PRUNER
Long Arm plus pulley for greater leverage. Light and easy to handle. Capacity 1" green wood. Choice of solid poles (8' to 12') or jointed poles (8' to 16').
NEW TYPE M POLE PRUNER
Economical in cost but perfect in performance. Double steel hook eliminates bending and breaking. Simple mechanism — spring cannot catch or interfere when cutting. Capacity 1" green wood. Choice of poles as above.
THE FAMOUS FORESTER HEAVY DUTY BRUSH CUTTER
Faster and safer for clearing brush & cutting roots. The only cutter with the exclusive slide shift which increases power during cutting operations. Comes in two sizes. Cuts up to 2" green wood and leaves flush, flat-topped stumps.
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Your Company can profit by the use of Porter Pruners
See them all in the Porter Catalog. Write for it today.
H. K. PORTER, INC.
Somerville 43, Massachusetts

News on New Products

"ERECTOR SET" CABINETS—An ingenious new method by which industry, selecting from 75 mass-produced "building block" metal cabinet enclosures and working with 125 different sub-parts, can work up infinite varieties of cabinets to house instrumentation, automation, electronic, and electromechanical equipment, has been announced by Elgin Metalformers Corp.

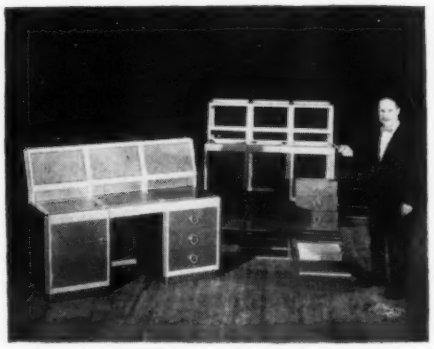
Industries already using the novel cabinet system include aviation, electronic, petro-chemical, heavy manufacturers employing automatic control equipment, and the auto manufacturers. Multi-million dollar computers and elaborate electronic brains are also going into the modular units.

Other industrial applications range from housing burglar alarm controls, to automatic paging systems, to public utilities control equipment.

The Armed Forces are heavy users, the company states; cabinets have turned up as enclosures for vital control equipment at rocket launching and guided missile proving grounds, and even on Eniwetok atoll, the unique cabinets have served for Atomic Energy Commission "H" bomb tests.

In reality, a flexible system for product and design engineers to use, the plan is a new concept in metal cabinetry for American industry, according to the company. With the rapid growth of the electronics industry, the extension of instrumentation and automatic control techniques into factories in all production fields, it was found that the one major bottleneck was the lack of appropriate enclosures which could be swiftly produced, at low cost, with the quality required consistent with the delicate and expensive equipment industry was using.

The company says the answer came with the introduction of a veritable "engineer's erector set" composed of sub-parts pre-fabricated by assembly-



line methods. Merely by drawing parts out of stock, finished cabinets in wide varieties of shapes, sizes, and models can be constructed by screwing together different tops, backs, sides, and fronts to the basic modular steel framework skeletons.

Airplane-type construction is used in the skeleton frames. Panel mounting holes are punched automatically in long sections so that the entire interior of the frames are ready to take endless varieties of "skins." Forty different types of panels, four different size drawers ranging from 7 to 14 inches high, and 16 inches deep make up the

(Please turn to page 51)

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Please have the manufacturer send me without obligation the literature indicated by the following numbers:

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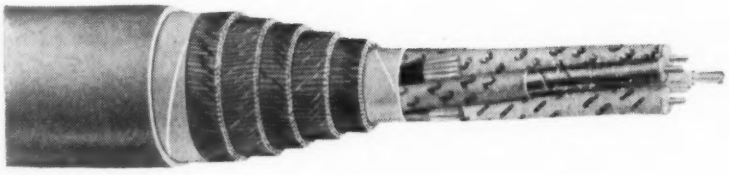
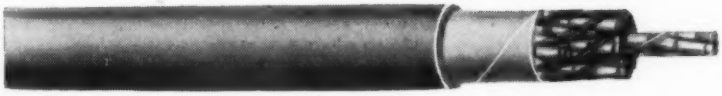
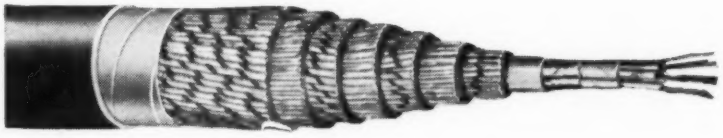


Composite Co-axial and Audio Long Distance Telephone Cable



60 Channel 14 Pair Carrier Telephone Cable



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construction and maintenance DIGEST

- **Insure your power**
- **Long-lived service**
- **Supersonic splice**
- **No clamps, no clips**

Published regularly to help you get the most out of your materials and supplies dollar

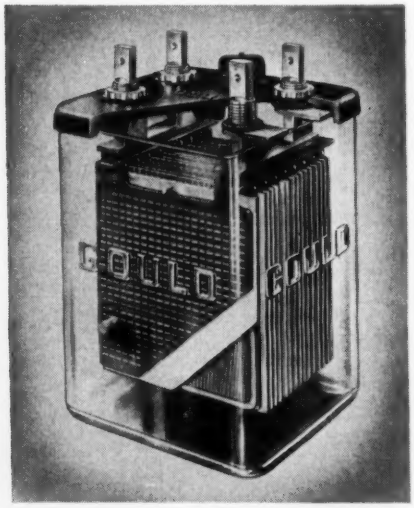
by John W. Garbutt, Inside Sales—Rochester

As a volunteer fireman I have to be alert at all times, just as Stromberg-Carlson is always alert to meet your supply needs. We're "on the job" for you 24 hours a day—because telephony is our full-time job, not just a sideline. Every order we fill for you brings you fine products, protected by a double guarantee—ours, and the maker's. And the attention given to your order is as careful as if our total program depended on it—because it does! Your supply business makes possible the research program that discovers new and better telephone equipment—to serve you. It's a pleasure to be working with you—we sincerely appreciate your support!

Insure your power supply

Because Planté batteries practically last forever...providing standby power that never fails...they're the best operating insurance you can buy. In switchgear, signal and alarm systems, or emergency light and power applications, these lead batteries have rolled up amazing performance records . . . are famous for their ability to deliver a powerful surge or a steady flow of current the instant it's needed. Make sure you're in operation . . . always. Choose Gould Planté.

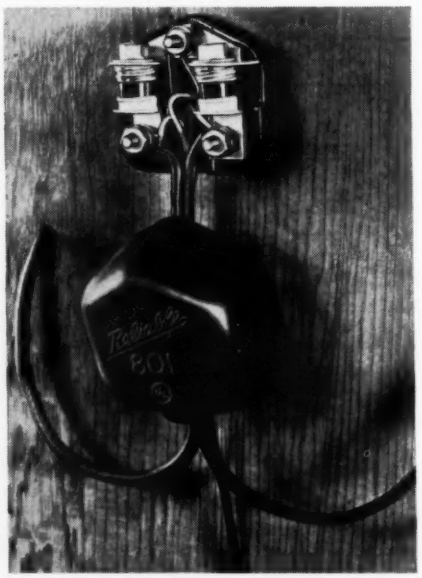
Your Stromberg-Carlson representative can offer prompt delivery on your order.



A sure, dependable supply of power when you need it. That, briefly, is the story of this Gould Planté battery.

Long life under all conditions

You get long service life under all kinds of weather conditions with the Series 800 Fuseless Protector, recently developed by Reliable Electric Company.



Easy to install and maintain

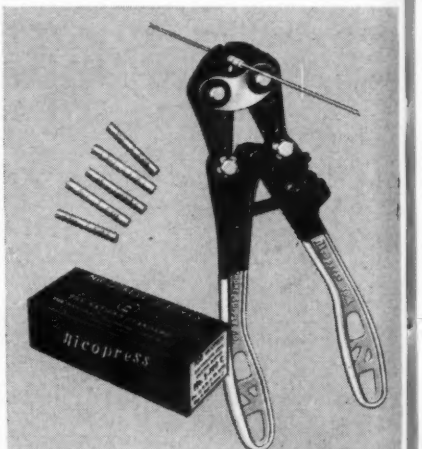
This new protector is available with Reliable No. 504 Protector Units (as No. 801) for station protection and with Reliable No. 506 Protector Units (as No. 801A) for cable protection.

The weather-tight neoprene cover has passed the Underwriters Laboratories severe requirements for performance and weathering under temperature extremes. The protector is listed under UL Re-examination Service.

The neoprene cover fits snugly and drops out of the way conveniently when protector is installed or serviced.

High-speed splice outlasts the wire itself

You can cut half the time off splicing wires—and get a splice that will actually outlast the conductor itself!



Available for all types of wire: Nicopress sleeves. Special Nicopress tool is easy to use.

Because it is stronger than the rated breaking strength of the wire, you just can't pull apart a joint made with the Nicopress sleeve. It will withstand the toughest strains of vibration, yet makes a neat, compact splice that you can use on drop or inside wires as well as other lines. A tough inner alloy lining—harder than either the sleeve or the conductor—is the secret of Nicopress sleeves' strong grip.

To apply Nicopress sleeves quickly and simply, use the Nicopress tool, which is specifically designed to work together with the sleeves for high-speed splicing.

XUM

You save up to 99c on each guy strand

Save as much as 99c per guy strand with Preformed Guy-Grip dead-ends—the safe, low-cost way of dead-ending guy wires.

Install PLP Guy-Grip dead-ends quickly and easily by hand.

Since each PLP Guy-Grip dead-end provides its own loop-eye, you don't need clamps, clips or loops, and you need less strand. Yet these Guy-Grip dead-ends hold the full-rated strength of *even* extra high strength steel strand.

You enjoy a substantial saving on installation time because the job is easily accomplished by hand, and most of the application can be done on the ground.

PLP Guy-Grip dead-ends can be applied either to the cut end or the coiled end of the strand, which means you can cut the strand to proper length after application of the Guy-Grip dead-end.

Did you know . . . that the Stromberg-Carlson general catalog has more than 100 pages of maintenance and construction supplies alone? You can do *all* your business "under one roof" and find the same quality and reliability in every item.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

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component parts which can be fastened to the frames.

Writing desk tops, sloping front consoles, extended arm cabinets and turret panels can be provided, as well as units for television monitoring, according to Samuel K. Frankel, president of EMCOR, who, along with James G. Wells, vice president and a veteran in the electronics industry, conceived and pioneered the modular system of enclosures. Readily available in stock are heavy-duty industrial-finish Formica writing tops, desk panels, and Plexiglas tops designed to protect and display memory boards or circuit diagrams for easy reference by the instrument operator.

Frames may be bolted together side by side, front to back; they may be stacked one on top of another; or they may be assembled in combinations. In stacking, the components can be built to reach 81 inches in height; the smallest units measure 21 inches.

All panel openings in the frames are designed on the 19-inch standard communications module. The company states that maximum fastening strength and ease of installation of the panels are insured through the use of Tinnerman speed nuts, and Phillips head screws. The assembly technique has been further streamlined by eliminating conventional cup washers and replacing them with ornamental head screws with undercut heads.

Built of cold rolled, heavy gauge steel, and finished in a two-tone gray baked enamel with a Bonderite base, the cabinets have been designed to meet nuclear decontamination requirements and have high air venting characteristics. They coordinate well with plant interiors and other electronic, automation and instrumentation equipment.

To complete the cycle of economy in time and delivery, not only are the components ordered from stock, but all sub-assembly work is done at the factory with all panels bolted in place, and drawers, and doors inserted. Companies and engineers ordering the units merely have to bolt together the overall assembled component to make their finished console or control cabinet.

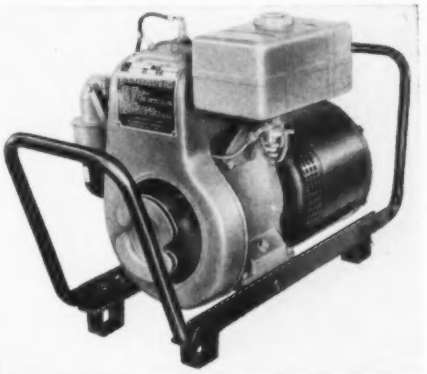
One of the more elaborate consoles is factory sub-assembled from 30 component modules. The smallest EMCOR unit is a 13-inch instrument cabinet.

EMCOR reports that the standard line of modular cabinets will satisfy 75 per cent of the equipment enclosure needs of industry.

A special order department has been set up to make minor modifications to meet particular product and equipment designers' needs. The cabinets can be ordered enamel-finished in the standard two-tone gray colors, in special colors, or can be secured unpainted. Request NP636.

•

GENERATORS—Close voltage regulation and generous overload capacity are said to be among the many features combined in the new low-cost, gasoline-engine generators just announced by Homelite. The new 3,000-



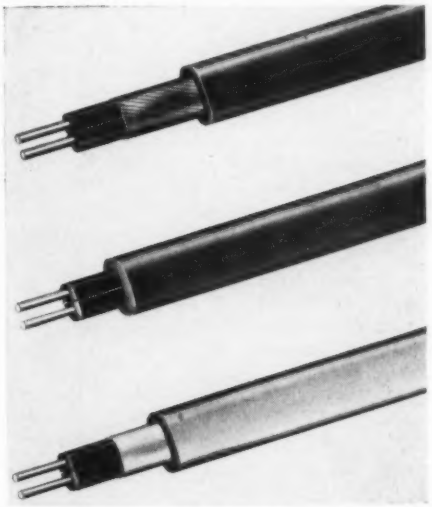
watt generators were developed to provide power for floodlights, portable electric tools and emergency stand-by service.

Lightweight, easy to carry to any job location, the Model 41 Generators will operate electric drills, saws, pipe threaders, hammers, floodlights and other electric tools.

The Model 41 generators have no bc brushes, commutators, dc windings or intermediate couplings. Request NP637.

•

BURIED WIRE—Superior Cable Corp. recently announced the manufacture of three types of plastic insulated and jacketed direct burial wire.



The spiraled flat steel strip shield of green jacketed Superior DB No. 2178 resists damage from road or farm machinery, implements and other similar sources.

KLEIN

preferred by linemen
. . . electricians

When it comes to leather goods for linemen or electricians, the name Klein today stands for the highest in quality as it has since the first wires were strung.

In Klein-Kord, too, Klein offers to industry the first specially woven fabric for safety straps—a fabric designed to permit the use of a tongue-type buckle without the risk of slitting or ripping under severe strain.

Now in Nylon Klein-Kord safety straps Klein still leads with the newest in safety equipment specially designed for use by utilities wherever power or communication lines are strung.

1857 100 YEARS OF SERVICE 1957

Write for Free Tool Guide
A free copy of the new Klein Pocket Tool Guide will be sent to anyone interested on request.

Ask your supplier

Foreign distributor:
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Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

Superior DB No. 217 B has a longitudinal bronze shield encased in a yellow jacket. It is effective in resisting damage from insects and rodents. It is suggested for use also where peculiar soil conditions are conducive to increased lightning activity.

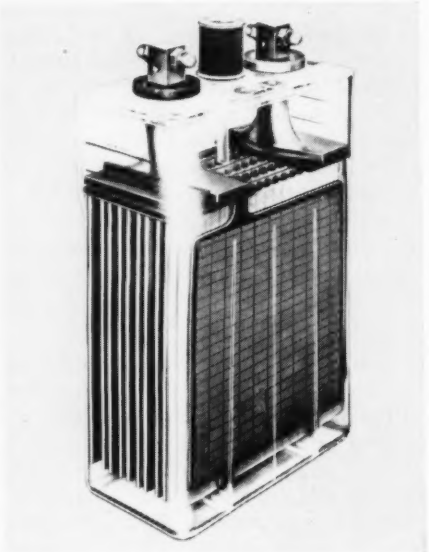
For direct burial installations in areas where normal conditions prevail and no specific hazards are likely, Superior recommends its red jacketed, non-armored burial wire, DB No. 217.

All three types are available with 16 or 17-gauge copper conductors. Request NP638.

•

MICROWAVE BATTERIES—Microwave systems can now take advantage of two lines of C & D batteries used in telephone service.

The same features of C & D PlastiCell® and PlastiCal® (see cut) batteries are now available in C & D batteries being used for microwave



communication applications. The batteries are engineered to provide emergency standby power in unattended, out-of-the-way microwave transmission and relay stations.

Both lines of batteries feature one-piece, shock-resistant, clear plastic cases built to withstand rough handling in rugged terrain. Lighter weight permits easier transportation to remote locations. The batteries afford long distance systems the means for low "in place" power costs, the company states.

PlastiCell is the company's standard-type lead-antimony battery, while PlastiCal represents the lead-calcium battery. In actual microwave station service, PlastiCal batteries have required no water additions for more than a year.

Plates are extra-thick (0.250 inch and 0.266 inch), with uniformly cast, high-tensile lead-calcium alloy grid structure and maximum cross-sectional area bars. Exposed surface is held to a minimum to reduce wear and corrosion and increase life.

Other listed features of both transparent microwave batteries include high-low level lines for instant indication of electrolyte level; ball cage indicator (in sizes from six to 100-ampere-hours) to show state of charge at a glance; and patented Saftee-Vent to protect personnel from the danger of accidental explosions. Request NP 639.

•

ELECTRICAL TAPE—Bi-Seal electrical tape, Type 2A, a product of Bishop Mfg. Corp. now offers operating temperature ranges from a new high of 85°C to a new low of —55°C.

The improved tape, according to the company, never gets brittle; applies easily, even under extremely low temperatures, without stiffening or shattering, and fuses into a homogenous, water tight seal. It reports that tests reveal even longer weathering than the original long-life Bi-Seal under such weathering conditions as moisture, oxidation, sunlight, ozone, corrosive atmospheres, etc.

Bi-Seal listed features are: Virtually non-absorbent, self bonding, fuses into a solid mass, conforms perfectly to complex shapes, high dielectric strength, long storage life.

New Bi-Seal, it is said, provides as much or more protection than the original wire or cable insulation and is highly recommended for communication cable splicing, moisture-proofing bi-metal connections, sealing corrosion-resistant conduit couplings and insulating high frequency electronic circuits. Request NP640.

•

CABLE REEL LIFT—Increased safety and cable reel lifting capacity

No unused equipment here! With a Stromberg-Carlson No. 3 Toll Board, you buy the number of positions you need now—whether your toll center is large or small—and add more as your business grows.

Pay only for what you use

Here is a toll board that *grows as your own business grows.*

When you buy a Stromberg-Carlson No. 3 Toll Board, you buy exactly what you need *today.* Then you add positions—one at a time —*as you need them.* You continue to give your subscribers the finest toll service without tying up money in unused equipment.

And that's not the only important advantage you enjoy with this board. Here are a few more:

★ Supervisory and signaling functions are in the line or trunk circuits, instead of in the cord circuit. This arrangement is particularly economical when you have a large number of cords in relation to trunks.

★ For simplified maintenance, no auxiliary contacts are used on jacks.

★ You can remove jack sleeves from the front without disturbing switchboard operation.

★ All equipment for cord circuits, position circuit, and operator circuit is mounted in the switchboard and has been wired and thoroughly tested at the factory.

★ The board can be supplied with keysenders for use with dial equipment. Keysenders provide greater operating efficiency by greatly increasing the sending rate.

To get the complete story on the profit-boosting features of the No. 3 Toll Board, call or write the Stromberg-Carlson representative in your area.

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GD GENERAL DYNAMICS

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- An entirely new one man test set for locating aerial wire troubles. Easily and quickly locates all troubles from dead shorts and grounds to grounds and shorts with resistances that run up into several hundreds of thousands of ohms.
- Positive location of trouble spots: Locates the position of grounds and shorts and crosses in a minimum of time.
- Simple to use: One man with little or no previous experience can locate high resistance shorts, crosses and grounds.
- No need cut or open lines to locate troubles: With the Telo Cater Parallel test set it is no longer necessary to open your lines at test points, or cut your lines to determine the direction of your trouble.
- Not necessary to put line out of order while testing.
- Ideal for carrier line maintenance: Keep your aerial wire plant used for carrier in top notch shape.

CUMMINGS & NOTT, MFG.
P. O. BOX 143
PHILOMATH, OREGON

are provided by the improved Reelift recently introduced for utilities by Hykon Mfg. Co.

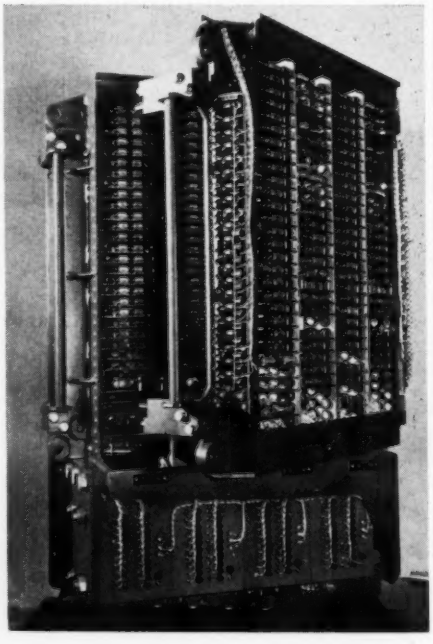
Featuring welded construction throughout, the Model RL31 raises cable reels up to 48 inches diameter

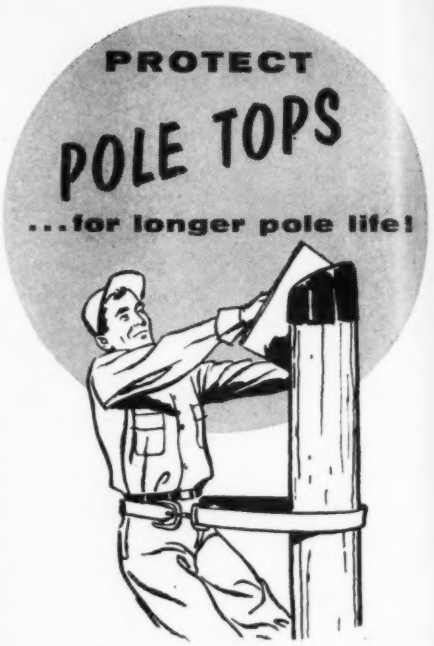
and 31 inches wide. Increased safety factory in design gives greater protection against injury, damage and breakage. The Reelift makes it possible for one or two men to lift heavy cable reels.

Improvised jacks and other devices are eliminated; broken flange reels are readily handled with ease and safety. The Reelift measures 48 inches high and 23 inches by 39 inches on the base, weight 85 pounds. Request NP 641.

•

ELECTRONIC SWITCHBOARD — A 20-line telephone exchange which is fully electronic and completely automatic has been completed for the French Navy by Laboratoire Central





Keep WATER and WEATHER from causing pole roof deterioration and your standing poles will REMAIN STANDING as much as 10 to 20 years longer. Fungus, wood fiber shrinkage and swelling, freezing and thawing are a thing of the past simply by having your own crews apply POLE TOPPERS. Every line truck might well have a supply on hand at all times and make the applications along with their regular line work.

POLE TOPPERS
Actual size 15" dia.

Those neat appearing, protective pole roof tops that are easy to handle — easy to apply. POLE TOPPERS contain 5% Penta.

Your own linemen can make an application in LESS THAN A MINUTE, once in position. Use POLE TOPPERS for all standing poles — for new poles or newly cut poles — for poles in the yard.

POLE TOPPERS . . . the most inexpensive and satisfactory preservative ever devised for successful, permanent use. The Price is but $1 each. Shipped in cartons of 1 Doz. weighing 13 pounds packed. Why not sample POLE TOPPERS and prove their value to your company?

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Producers of a complete line of wood preservatives

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UTILITIES • FARM and HOME

de Telecommunications, Paris research associate of International Telephone & Telegraph Corp.

Through the use of advancements in the field of semi-conductors, all mechanical movements and metallic contacts have been eliminated, and the instantaneous operation of this switchboard opens the path to the placement of telephone calls by means of push buttons rather than current dialing systems, IT&T states.

For civilian use a great deal of additional development is required, covering the devices used, the systems, the manufacturing methods, and the installation and maintenance procedures. However, Dr. Georges Goudet, managing director of LCT, states "electronic switching brings not only speed in putting through communications but also a great reduction in maintenance expenditures, and above all in the space required for telephone exchanges. In particular, in large towns where space is scarce and costly, it will be possible one day with electronic switching to install exchanges of 30,000 to 40,000 lines in premises at present occupied by exchanges of 10,000 lines."

The rugged operating conditions, both shock and climatic, aboard a modern naval vessel have prevented telephone equipment aboard such ships from progressing beyond the manual switchboard. The extreme ruggedness of an electronic switchboard, in which there are no moving parts to be disturbed by shock, has suddenly brought telephone communications aboard ship to a position of surpassing even the most modern land based exchanges. The built-in characteristics required of this new switchboard in such an installation prevented the use of vacuum tubes or vapor tubes, with even the transistor being ruled out because of the uncertain life expectancy, IT&T states.

The speed of operation is such that an "order" is carried out by the diode switch in less than a thousandth of a second after the end of dialing.

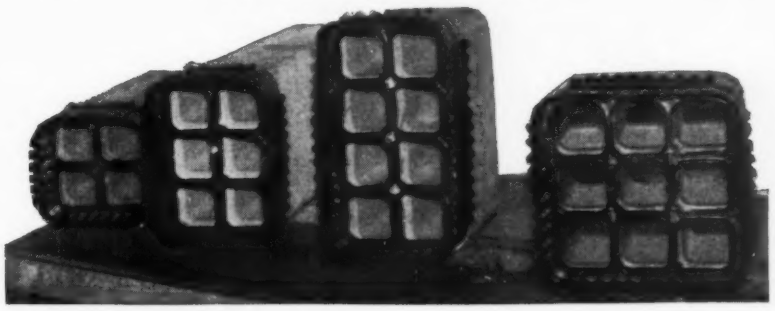
This speed provides the incentive to replace the calling dial, the rotation of which is too slow, by a device which registers immediately the numbers and letters of the subscriber being called.

In effect, a 10 to 15 seconds operation will be reduced to as little as three or four seconds for an experienced operator, greatly reducing the amount of switching equipment needed to serve a given number of subscribers. Request NP642.

•

DIAL BANK CLEANING BRUSH—P. K. Neuses, Inc., has announced a

PATENT APPLIED FOR



NOW! MTD Sleeve Connectors

for faster, better and lower cost underground construction use MTD sleeve connectors instead of costly time consuming mortar bandage for connecting underground multiple duct tile.

Many Thousands Now in Use!

Let us have your scheduled use for this season—ask for prices on 4, 6, 8 and 9 way sizes.

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PLANTS AT

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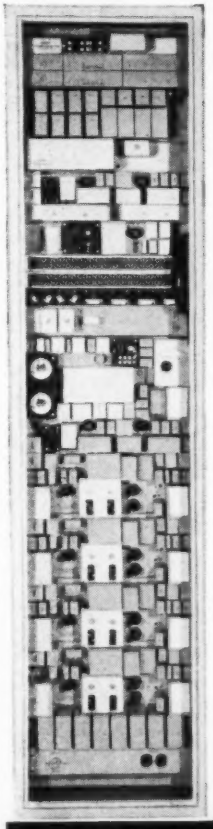

FOUR-CHANNEL OPEN-WIRE CARRIER-TELEPHONE SYSTEM.

This is a high-grade long-haul system compatible with three-channel type C, OA-11/FC and OA-12/FC systems. The fourth toll-grade channel has been obtained by advanced filter and oscillator-network design without changing the frequency allocation or degrading the performance of the three carrier channels or of the physical circuit. Transmission in one direction is in the band 3.4 kc to 15.65 kc, and in the other direction in the band 17.95 kc to 31.4 kc. On copper conductors repeater sections average 200 miles, and high-grade circuits several thousand miles in length can be maintained under all climatic conditions.

Type AN/FCC-10 Carrier-Telephone Terminal manufactured for the U.S. Army Signal Corps. This terminal includes regulated-tube rectifiers, d-c telegraph composite sets, line protectors, operator's telephone set, 4-wire terminating sets, v-f signal converter type CV-399/FCC, and all accessories to form a complete packaged 4-channel terminal. It is moisture- and fungus-proofed, and meets all applicable MIL specifications. It is a-c operated.

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"LIVE" WIRE CUTTING!
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COHARDITE
ELECTRIC WIRE
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— because PORTER COHARDITE-INSULATED ELECTRIC WIRE CUTTERS are built to meet the exacting safety and work-speed demands of Utility men. Center cut jaws easily cut insulated soft to medium hard wires, copper wire and medium hard steel wires up to ½". Rugged, hot-molded, special semi-hard rubber (Cohardite) handles, assure top toughness, high dielectric strength — and resist oxidation and chemicals. Each tool factory-tested to 20,000 volts.

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use the TN
STEEL CABLE CUTTER!

Shear-action cutter — for general cutting of all soft or hard steel cable or wire rope up to ¾". Notched jaws lock cable during cut, minimizing deforming.

For COPPER and ALUMINUM CABLE
use the 2CN
SPECIAL SHEAR CABLE CUTTER

Designed for cutting soft, non-steel power cables, insulated or not, up to 1⅜" O.D. Jaws pass each other for clean cutting. A must for every efficient utility crew.

WRITE
for folder showing many other needed utility company cutting tools.

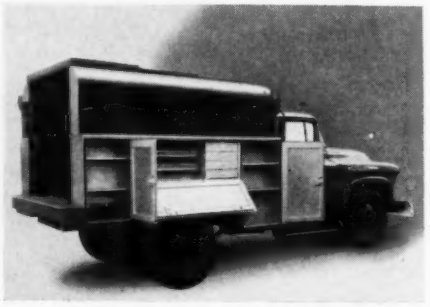
HKP®
H. K. PORTER, Inc.
Somerville 43, Mass.

new dial bank cleaning brush for brushing dust and other accumulations from the terminal levels of selector and connector banks in step-by-step automatic

telephone systems. It is constructed with a dielectric fibre handle and nylon bristles. Size is 2⅜ inches x 6 inches. Request NP643.

•

TRUCK BODY—Stahl Metal Products, Inc., has recently introduced the Stahl "300" light line construction and maintenance body. A body, 112 inches long, 1½-ton chassis and cab, the "300" is built for "all-weather" operation, providing generous storage space and special equipment as required.



An additional model, the "300-A" fits 1½-ton or 2-ton chassis and measures 138 inches long. Shelves, bins and material trays are located for easy access and convenience. The "300" is built of cold rolled stretcher levelled auto body steel with special reinforcements at all points of strain.

It is equipped with optional accessory equipment, including hydraulic pole derrick. Request NP644.

•

ELECTRIC PUMPS—A 35-pound submersible electric pump, which handles 3,300 gph at 5-foot head, is offered by Speed King Mfg. Co., division of The Jaeger Machine Co.

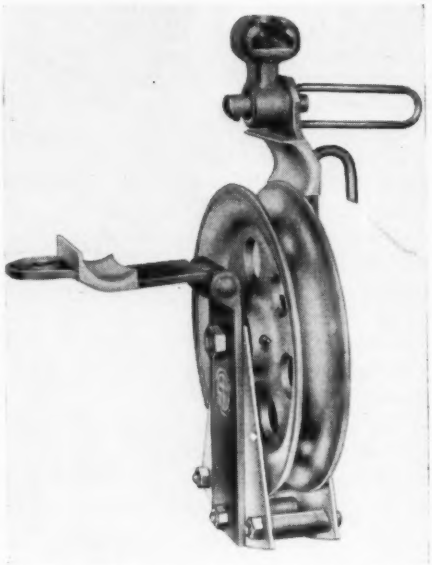
The pump is 11 inches high and 11 inches wide. The 1½ hp, single phase electric motor is hermetically sealed.

The pump, corrosion resistant, even in salt water, is designed for manhole pumping. Float switch is standard equipment for automatic operation. Built-in thermal overload protector cuts off power if motor overheats for any reason and restarts automatically when motor cools. Request NP645.

•

STRINGING SNATCH BLOCKS—A series of new stringing snatch blocks has been developed by Sherman & Reilly, Inc. It is identified as the S&R No. 74 Series.

The company states that the feature of the new Blocks is the smoothly rounded conductor guard of strong, light weight aluminum which follows the contour of the sheave. Should the conductor ride out of sheave groove, it comes in contact with smooth aluminum surfaces only, thus virtually eliminating possibility of damage to the conductor. This advancement in design also prevents the conductor from accidentally working between sheave and side plate.



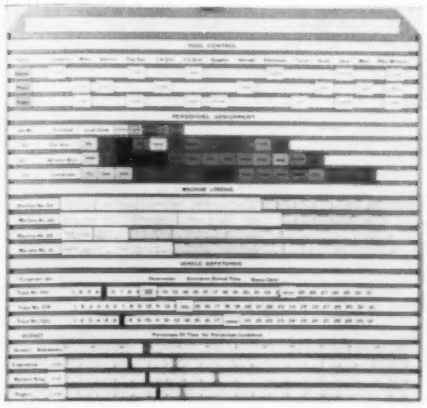
The S&R No. 74 series is of the safety-locking type. They cannot open accidentally, but when the pin is rotated 90°, the block opens on a sturdy hinge. The polished groove sheave is of tough aluminum alloy and rolls on two shielded ball bearings.

The blocks are available in five standard sizes, ranging from 7 inches x 1⅜ inches, to 16 inches x 2⅛ inches. They can be obtained with the following maximum strength, minimum weight forged steel fittings: Swivel hook, socket connector, swivel eye, upset swivel shackle. Design modifi-

cations for specific application can be made. Request NP646.

•

VISUAL CONTROL PANELS—Acme Visible Records, Inc., announces availability of lightweight visual control panels containing from 25 to 100 clear plastic tubes (in 17-inch and 40-inch widths).



Tubes are individually removable and easily shifted from one position to another. They are easily adapted to practically any kind of control records, the company states. Various sizes and colors of signals offer limitless signalling and charting possibilities.

A control panel schedule and allocation of manpower for a telephone company indicates jobs in work and individuals assigned to these jobs. VC-0-1 overriding signal, with white insert listing job number and location, is placed at left hand side of each tube.

VC-0-1 with other colored insert is placed to the right of the job signal listing the name of the workman assigned to the job. Ten signals are used. The category of the work performed by the individual is shown by the color used for the insert—for example, blue for line workers, red for truck drivers, green for common laborers, etc.

If a worker is sick or on vacation, his signal is moved to the extreme right of the tube. The company states the signals give a quick, visual picture, providing for easy shifting of men to meet changing situations. Names once typed are reused over and over, which reduces clerical and administrative time. Request NP647.

•

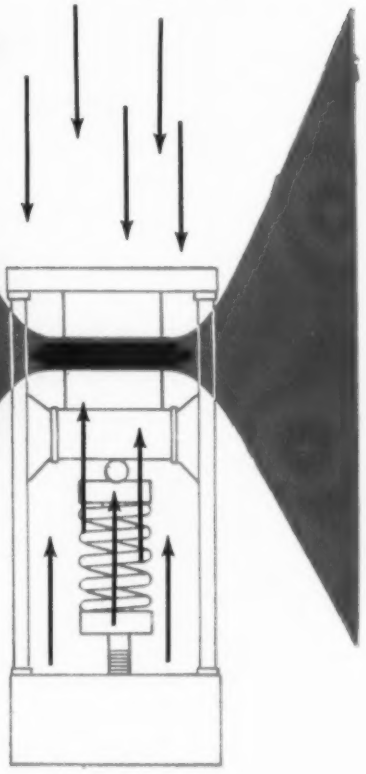
MICROWAVE TOWER LIGHTING—A new line of microwave antenna tower obstruction lighting control and alarm units has been announced by Hughey & Phillips, Inc.

Designed to meet FCC and CAA requirements for unattended radio relay installations, the units also incorporate

1500 pounds

MINIMUM COMPRESSION RESISTANCE OF

ALPHADUCT DROP WIRE



Alphaduct drop wire is designed and built to be the longest lasting drop wire you've ever installed. It's tested . . . completely, thoroughly and often to make sure that every single coil is up to Alphaduct's rigid standards.

Here's how the insulation is tested to make sure it won't crush.

Short lengths of Alphaduct are placed between the steel plates of a compression testing machine. These plates are then forced together at uniform speed until the insulation crushes. Alphaduct parallel drop wire has to withstand a minimum load of 1500 pounds before it breaks. Each conductor of Alphaduct twisted pair will withstand a 1000 pound pressure.

You don't have to worry about a little rough handling breaking down this kind of tested insulation. Try Alphaduct drop wire. It's dated, so you can see for yourself the extra wear it provides.

ALPHADUCT WIRE AND CABLE COMPANY • NEW BRUNSWICK, N. J.

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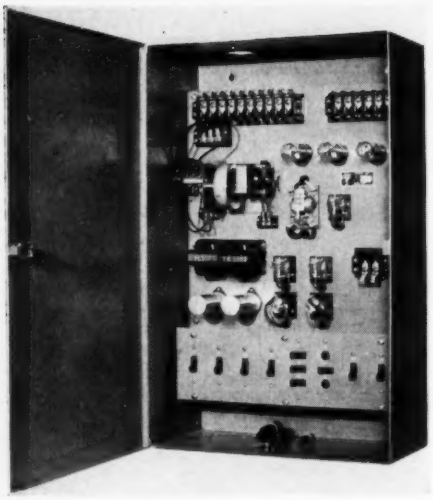


all control, test and lamp failure alarm features specified by the AT&T Long Lines Department.

Housed in a single, compact cabinet for indoor mounting, the control units are available in several types to accommodate towers requiring one, two, or three light levels. Request NP648.

Subsidies are Weakening

". . . an economy that rests on government aid rests on the shakiest of foundations." — EDITORIAL STATEMENT, *The Wall Street Journal.*

Safety Council Issues Two Industrial Safety Leaflets

Safety is just good business—and it's easy if seven basic steps are followed, according to the National Safety Council.

The steps are included in a one-fold leaflet, "Seven Steps to Safety," a digest of the council's previously published eight-page booklet, "Plus Costs of Accidents.'

Safety experts have viewed the leaflet as a "most concise" statement of principles of industrial safety. Here's a summary of the seven steps:

(1) Insist on safety.
(2) Assign someone to help on details.
(3) Locate trouble spots.
(4) Make the job safe.
(5) Control unsafe habits.
(6) Keep simple records.
(7) Get employees into the act.

Single copies of "Seven Steps to Safety" may be obtained on request from the Small Business Program, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

•

Near Misses . . . Keep Your Guard Up . . . Stay on Your Feet—these aren't corner instructions to punchy boxer, but some of the titles in a new volume of "Five Minute Safety Talks for Foremen."

Book 7, published recently by the National Safety Council, contains 52 talks on accident prevention.

They were prepared by Roland F. Blake, a leader in safety engineering and editor and co-author of "Industrial Safety," a book on accident prevention fundamentals.

The five-minute talks come with an outline and text suitable for either informal or scheduled training sessions.

The booklet includes up-to-date material on such varied topics as vacation safety, smoking, horseplay, how to use a screwdriver, lung safety and hot weather hints.

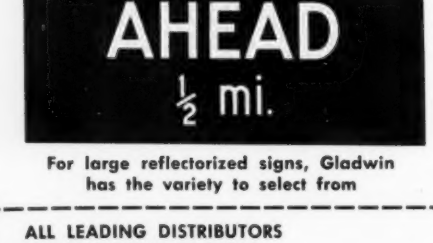
Further information and prices may be obtained from the National Safety Council.

Government Worker

Taxpayer's Dollar, a publication of the Chamber of Commerce of the United States, passes on this definition of a taxpayer— ". . . a person who doesn't have to pass a civil service test to work for the government."

MAKE GLADWIN PLASTICS, INC., YOUR SOURCE FOR QUALITY PLASTIC PRODUCTS

Over 20 designs and legends reflectorized steel road signs



For large reflectorized signs, Gladwin has the variety to select from

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NIGHT AND DAY IT'S THE *NEW* GLADWIN BOOTH ROOF SIGNS

Redesigned to modern lines, made of proven White Plexiglas Fluorescent lights to BE MORE BRILLIANT

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INSULATED CIRCUIT

Concluded from page 26

This is based on allowing $60 per circuit mile for the insulation, which is a compromise of several bids received. These bids are based on the wire being drawn and coiled in one factory, transported to another factory, uncoiled, insulated and recoiled for shipment to a job. Obviously, considerable savings could be obtained through more direct insulating methods.

It can be seen from *Table III* that the insulated open wire pair is more costly than bare open wire in both single and multi-circuit leads. It is noted that "B" rural wire is also cheaper than a four-circuit lead. This is not important since "B" rural is used primarily for local distribution where its higher voice frequency attenuation is no problem. Where carrier is desired it would be necessary to provide an open wire overbuild if more than an entrance length of "B" rural were involved.

The single pair with air dielectric is slightly less in cost than the parallel extruded 14-gauge Copperweld pair. Again, this is of minor interest since the parallel extruded type is not an adequate transmission medium as line wire for the REA systems of interest.

The cost comparisons indicate that where there are factors involved in particular situations (i.e., heavy foliage, salt spray, high winds), etc., where the advantages of the insulated pair are particularly important, the use of the insulated type of plant can be justified.

As more widespread use of this type of plant takes place, specific information on maintenance and operation will be obtainable. This information will permit firm analysis of the ultimate field of use of this type of plant from first cost, annual costs and operational standpoints.

Only minor savings in annual costs are needed to prove in the design even with present costs of insulating the wire.

WESCON to Hold Session On Communication Systems

For the first time in its history, the Western Electronics Show and Convention (WESCON) at San Francisco on Aug. 20-24 will have a technical session on communications systems.

Present plans call for one and possibly two of the 48 technical sessions of the four-day show and convention to be devoted to the systems aspect of communication.

Subject areas which may be included in the communications systems sessions

WANTED

manufacturer to produce and market this

KEY-TYPE TELEPHONE DIALER

I have four United States and nine foreign patents on a *key-type* telephone dialer which will operate singly or in series on any system including long distance and inter-com. The standard unit contains 26 keys which can be changed in a split second. No tape, no twisting of knobs, no switches — just depress a key and the number is dialed quickly and accurately.

I seek a royalty arrangement which can be developed following a demonstration of the dialer and discussion of your present manufacturing and marketing facilities. Inquiries will be held in strict confidence.

THOS. W. MACKENZIE

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are: multiplexing and channelizing systems, telephone and telegraph communications, modulation techniques, military communications and data transmission systems.

Authors wishing to present papers in these subject areas should send 100-200 word abstracts of their paper together with the complete text or detailed outline to:

A. M. Seymour
WESCON Technical Program Committee
Lenkurt Electric Co.
San Carlos, Cal.

by May 1, 1957 for consideration by the technical program committee.

This year, for the first time, an IRE-WESCON convention record will be published. It will include every paper presented at the convention and will be distributed nationally shortly after the convention.

Authors will be notified whether or not their papers have been accepted by June 1.

Falls: An Office Hazard

"More office workers are injured in falls than in all other accidents combined. Many result from slips on small objects such as paper clips. Pick up for safety!"—*National Safety Council.*

THE OPERATOR'S CORNER

Continued from page 32

answer signals in the order of their appearance?

(4) What phrase should be used in answering an information call signal?

(5) If the Information operator does not understand something the customer has said, or if she is uncertain of a detail, how should she proceed?

Answers are presented on page 64.

Work Starts on West Coast Microwave Installation

Work has started on the West Coast Telephone Co.'s microwave installation between Anacortes and Mount Vernon, Wash. The company has received permission for this installation from the Federal Communications Commission. This project, according to Lloyd Wallgren, district manager for the company, will involve a total expenditure of about $98,000. It will provide an additional 12 circuits between Mount Vernon and Anacortes.

The microwave system will supplement the present wire circuits out of Anacortes. Besides providing the additional circuits, it will also give the community an alternate route of communication.

"Microwave toll systems," Mr. Wallgren said, "in many cases have been the only reliable means of communication during severe winter storms when wire lines have failed. The new system will also be made a part of the Direct Distance Dialing program which is scheduled for completion during the middle of 1957."

In connection with the microwave system, the telephone company will erect a reflector tower on Cap Sante. The reflector will act as a relay. It will accept the microwave signals from a transmitter on the telephone company building at Anacortes and beam them toward another receiver and transmitter located on the exchange building in Mount Vernon. No power is required on the Cap Sante reflectors, except for the lighting of the towers for aircraft warning purposes.

Testing and activation of the system is expected to be completed within 60 days.

Named to Indiana Bell Post

John W. Kingsbury has been named assistant vice president, public relations, for Indiana Bell Telephone Co. He succeeds Philip D. Taylor who has been appointed Washington news manager for American Telephone & Telegraph Co.

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• NATIONALLY KNOWN TELEPHONE SUPPLIES

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A Span lengths up to 600 feet are possible with Rex One Pair Distribution Wire. Extra service poles are eliminated on long extensions and long drop runs.

B Economically installed — no cross arms, pins, or glass insulators. Wire is simply installed on tangent supports and drive hooks.

C No tree leakage — a heavy extrusion of high molecular weight, high dielectric strength polyethylene, enclosing both conductors prevents accidental grounding and eliminates excessive right of way clearance.

D Excellent transmission characteristics — similar electrical properties to R.E.A. listed Rural Distribution Wire assure good subscriber service.

E Easily transposed — no special brackets; simply twist span at installation. Cross talk and induction noise are kept to a minimum.

F Ordering data: Two conductors #12 or #14 AWG Copperweld or .083 steel. 5,000 or 15,000 foot reels.

Other REX TELEPHONE PRODUCTS

EXCHANGE AREA CABLE
R.E.A. LISTED
DIRECT BURIAL CABLE
RURAL DISTRIBUTION WIRE
R.E.A. LISTED
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'D' INSIDE WIRING CABLES

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REX WIRE & CABLE

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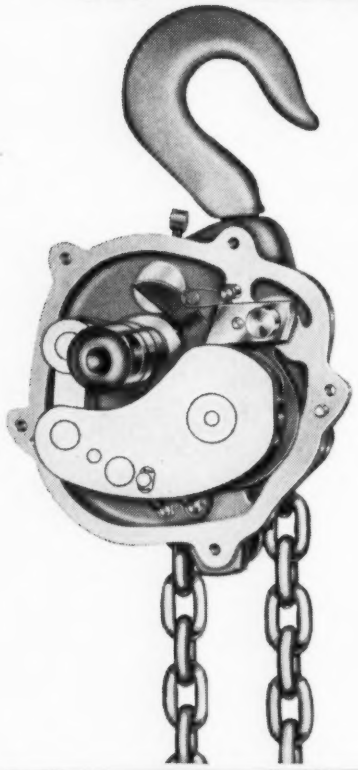
INDEPENDENT

New Compound Levers



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Super Power hoists are designed around a new compound leverage principle which enables workmen to raise loads with less handle pull than other hoists of the same capacities. Use of these compound levers also makes the hoists 20% lighter than competitive models.

Available in 1½ and 3-ton capacities in aluminum and 1½ to 5 tons in malleable iron, Super Powers offer sealed-in lubrication, "Safety Valve" handles, overload testing and constant load-locking ratchet-and-pawl construction. For complete details, consult your Coffing distributor, or write for Bulletin L-3. **Coffing Hoist Division, Duff-Norton Co., 808 Walter St., Danville, Ill.**

GENERAL MACHINE PRODUCTS COMPANY, INC.
Franklin & Wood Sts.,
Philadelphia 6, Pa.

#7458 SEALING COMPOUND. The C Resin Compound and activator, when mixed together, produce the proper proportion of flowable compound, known as one unit, to produce a plug or dam when desirable to sectionalize cable and seal cable terminals. The compound and activator is packaged in two sizes; regular size 50 gram compound and 16 gram activator, large size 168 gram compound and 64 gram activator. Additional information is available on installation and on the tools required.

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918 GMPCO

MAINTENANCE TESTING

Concluded from page 34

Fig. 3 shows the clips of an ohmmeter test cord in contact with the terminals of a transmitter unit removed from its case for the purpose of making a continuity test.

If a full scale deflection of the ohmmeter needle is obtained, the transmitter is short-circuited. If infinite resistance is observed on the meter scale, it is indicative that the unit is open. By infinite resistance is meant, a resistance that is without actual or conceivable bounds, or immeasurable.

(8) Transmitter contact springs weak. The purpose of the metallic springs inside the telephone handset transmitter case is to make the necessary electrical connection to the transmitter.

Therefore, good mechanical pressure must be maintained between the springs and transmitter unit. In some cases, this may require that the contact spring adjustment be altered to improve the contact pressure against the transmitter unit terminals.

Sometimes a transmitter fails to function properly because of a defective component in the telephone set. At other times, close examination or test may indicate the fault is due to an external interference, such as line trouble.

Occasionally there are cases when it is not known specifically whether a particular transmitter is good or bad. If this be the case, an easy way to find out about the condition of the suspected transmitter is to replace it by one known to be good.

In exchange areas where the local test desk is equipped with a transmission test circuit, the most direct method of determining whether or not a customer's telephone transmitter comes up to satisfactory requirements within an established transmission range, is to make a transmission test with the test deskman. If the test indicates that the transmitter is defective, it should be replaced.

(To Be Continued)

Intelligence and Ideals

"We must do more at all levels of education to better understand what we have, how we got it, and what we must do to preserve it. And we must make sure that our schools build ideals as they build knowledge. There is nothing more dangerous in the world today than high intelligence coupled with low ideals."—ROBERT WILSON, *chairman of the board, Standard Oil Co. of Indiana.*

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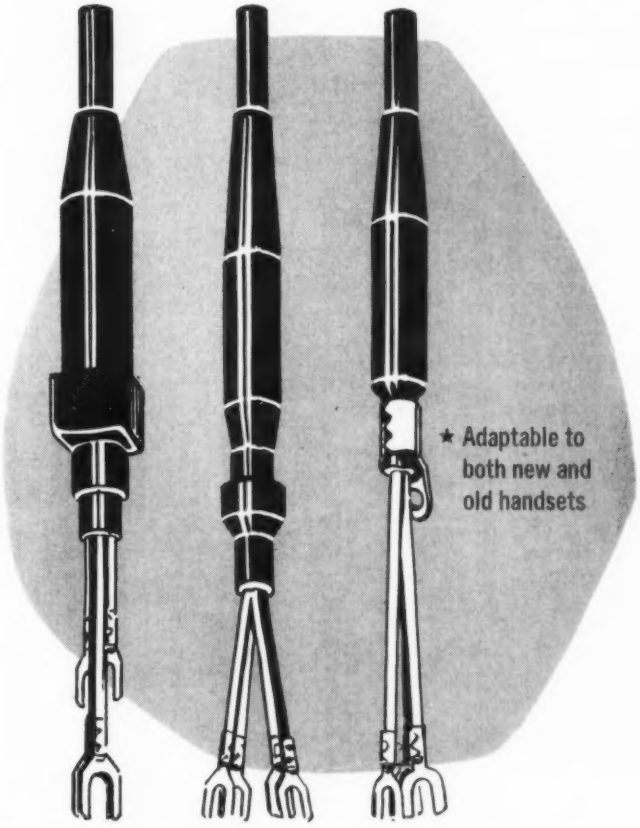

Now moulded neoprene strain reliefs are available on any Commercial neoprene-jacketed cord. These strain reliefs provide strong, reliable buffers against the wear of tugs and pulls. And they add still more years of service to the many you always get from any Commercial Cord . . . cutting "trouble calls" correspondingly. Service-tested, of course, and proved superior . . . but why not make your own tests? We'll be glad to supply samples, if you'll tell us your requirements.

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Gould Names Gulf Region And Export Managers

The appointment of Lewis L. May Jr., as Gulf regional manager, and of K. A. Vaughan as export manager, of the industrial division, has been announced by Gould-National Batteries, Inc.

L. L. MAY JR.

Mr. May will expedite the selection and service requirements of industrial battery users from the regional headquarters office at 4935 Cass St., Dallas, Tex. Gould-National's Gulf region includes Texas, Louisiana, Mississippi, western Tennessee, and southwestern Alabama.

K. A. VAUGHAN

An Air Force veteran, Mr. May joined the Gould organization in 1947 and prior to his appointment as Gulf regional manager had serviced battery sales in Texas and Louisiana since 1949.

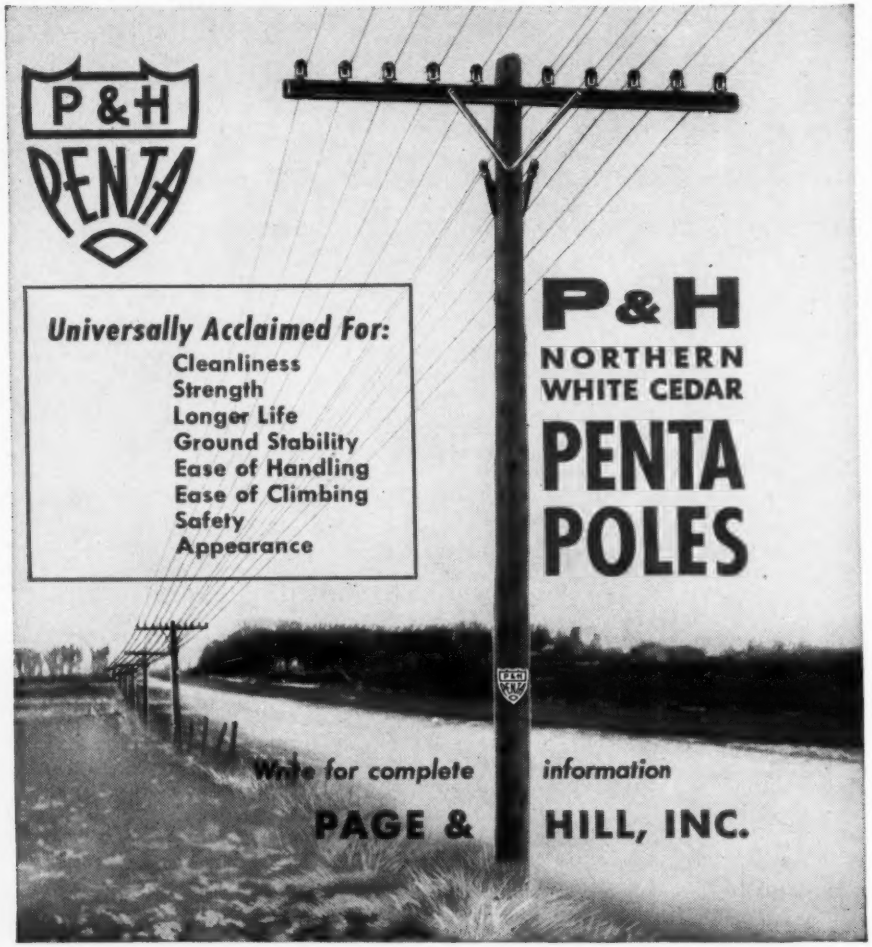
Mr. Vaughan, with headquarters at New York, will be responsible for the sale and foreign distribution of Gould industrial batteries and will also handle railroad and national accounts in the New York area.

K. A. Vaughan has been with Gould for almost 30 years. He has worked in almost every department in the company and his experience includes six years in production and 16 years in field engineering, the last nine of which were in the capacity of manager of field engineering.

Mr. Vaughan has written many articles pertaining to battery maintenance.

Analyzes Credit Demands

"Considering the heavy volume of business being carried on, the record-high levels of production costs, and the tremendous capital programs under way by industrial enterprises, public utility firms, and governmental bodies, credit demands could hardly be anything but correspondingly strong. The tendency, not only among business and public enterprises but also among consumers, is to use credit so as to spend tomorrow's income today." — *Excerpt from First National City Bank Monthly Letter, published by The First National City Bank of New York.*



Answers to Questions On Page 32

(1) Only when she is ready to accept the order.

(2) No, unless one call has been referred to the supervisor and she has directed the operator to accept new calls.

(3) Yes, except as follows:

(1) Give preference to calls from Long Distance.

(2) If both information and intercepted calls are handled at the same position, give preference to an intercepted call over a local information call.

(4) Answer with "Information" and if an immediate response is not received, say "This is Information." If you then receive no response, say for example, "Are you calling Information?" or "May I help you?" If still no response is received, disconnect.

(5) Either ask again, or repeat or spell it, as you understood it, in a questioning tone. After a reasonable effort if you still cannot understand the calling party, refer the case to the supervisor.

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. . . the most rugged, versatile, efficient of all

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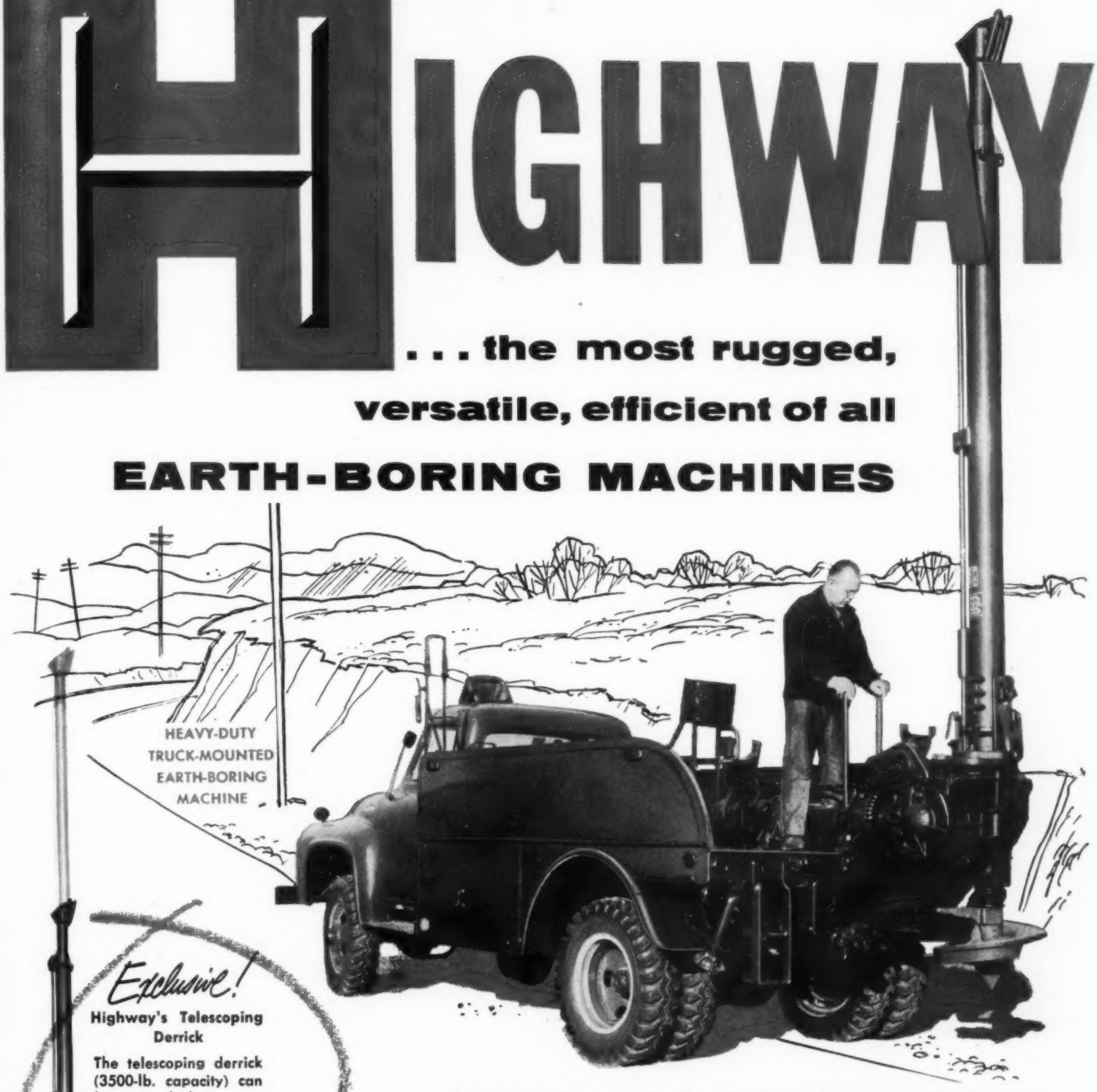

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The telescoping derrick (3500-lb. capacity) can be extended to more than one-half its collapsed length. Available as optional equipment on the Model "HC" machine.

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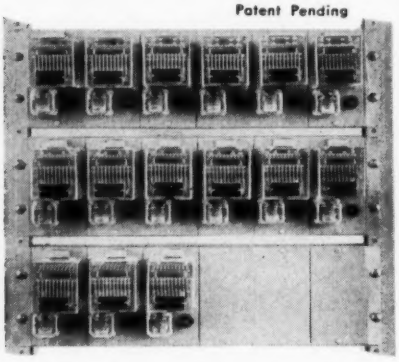

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W. F. Barnett, president of the Vashon (Wash.) Telephone Co. and his secretary, Olga Robinson.

Vashon (Wash.) Company Cuts Over to DDD

Vashon (Wash.) Telephone Corp. during the first part of April will cut over to Direct Distance Dialing (DDD), being one of the first in the state to do so.

The company serves 1,500 subscribers on Vashon Island. DDD will enable them to dial directly to Seattle, Tacoma and 17 of the surrounding communities via automatic time and ticketing equipment—a total of almost 500,000 telephones.

When W. F. Barnett, the Vashon company's president, took over the company from the Puget Sound Power & Light Co. in December 1945, it was serving 600 telephones. In the succeeding 11 years, the company has spent an average of $38,600 annually to improve existing facilities and install new automatic equipment. In 1956 this included the stringing of 15 miles of aerial cable. The company also is ready to tie into the nationwide DDD network.

Superior Cable Holds Two-Day Splicing School

Superior Cable's two-day splicing school attracted approximately 70 superintendents and cable foremen from 35 Independent telephone companies in southern Virginia and the Carolinas.

The school was held in February in the plant of Superior Cable Corp. at Hickory, N. C.

James Bowman, vice president in charge of sales, reported that the school was conducted as a public service to increase the knowledge of telephone cable men in the handling of plastic-covered cable.

Instructors were from Superior's engineering and sales departments. New techniques in plastic cable splicing, as well as new terminals and other equipment recently developed and now available for general use, were discussed and demonstrated at the meetings.

Beginning of Philosophy

"Here is the beginning of philosophy: a recognition of the conflicts between men, a search for their cause, a condemnation of mere opinion . . . and the *discovery of a standard of judgment.*"—EPICTETUS, in *Discourses*, First Century A. D.

Students at Superior Cable Corp. splicing school attended a banquet at the completion of the two-day session.

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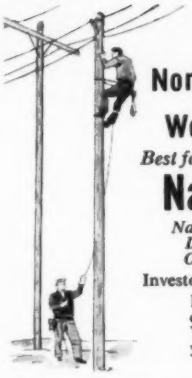

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